Final
Site-Specific Field Sampling Plan and Site-Specific Safety and Health Plan Attachments
Site Investigation at Area M2, Subsection of Area 45
Fort McClellan, Calhoun County, Alabama

Task Order CK04
Contract No. DACA21-96-D-0018
IT Project No. 773191

March 2000

Revision 1

Final
Site-Specific Field Sampling Plan Attachment
Site Investigation at Area M2, Subsection of Area 45
Fort McClellan, Calhoun County, Alabama

Prepared for:

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List of Acronyms

AcC2	Anniston and Allen gravelly loams, 6 to 10 percent slopes, eroded
AcE2	Anniston and Allen gravelly loams, 15 to 25 percent slopes, eroded
ADEM	Alabama Department of Environmental Management
BCT	BRAC Cleanup Team
bgs	below ground surface
BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERFA	Community Environmental Response Facilitation Act
CESAS	Corps of Engineers South Atlantic Savannah
CLP	Contract Laboratory Procedure
CSEM	conceptual site exposure model
CWA	chemical warfare material
DOD	U.S. Department of Defense
DQO	data quality objective
EBS	environmental baseline survey
EPA	U.S. Environmental Protection Agency
ESE	Environmental Sciences and Engineering, Inc.
FTMC	Fort McClellan
GPS	global positioning system
IDW	investigation-derived waste
IT	IT Corporation
PCB	polychlorinated biphenyl
PID	photoionization detector
PSSC	potential site-specific chemical
QA/QC	quality assurance/quality control
QAP	installation-wide quality assurance plan
SAP	installation-wide sampling and analysis plan
SFSP	site-specific field sampling plan
SHP	installation-wide safety and health plan
SI	site investigation
SSHP	site-specific safety and health plan
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture

List of Acronyms *(Continued)*

UXO	unexploded ordnance
WP	installation-wide work plan

Executive Summary

At the request of the U.S. Army (Army), IT Corporation (IT) has been requested to conduct fast-track site investigation (SI) activities at Area M2, Subsection of Area 45, at Fort McClellan (FTMC), Calhoun County, Alabama, to determine the presence or absence of potential site-specific chemicals at this site for potential quick release of the property by the U.S. Army. The area of this parcel was specified by the FTMC Transition Force.

IT will conduct SI activities in accordance with Contract No. DACA21-96-D-0018, Task Order CK04. The purpose of this site-specific field sampling plan (SFSP) is to provide technical guidance for sampling activities at Area M2, Subsection of Area 45.

Area M2, Subsection of Area 45, is a 20.23-acre area approximately 400 feet south-southeast of the Summerall Gate and Summerall Gate Road, east of the Anniston-Jacksonville highway and adjacent to the western Main Post boundary. The parcel is bounded to the south and east by a service road. A chain link fence extends along the southern parcel boundary. The overall elevation of Area M2 ranges from about 780 to 860 feet mean sea level (msl), with the higher elevation near the center of the parcel and sloping to both the east and west. Shallow groundwater flow probably follows site topography, with movement toward the northeast and east and somewhat to the west. A surface drainage feature crosses the southwest corner of the parcel with a west flow direction. Also, two small intermittent streams converge in the east-end of the parcel flowing north and merge with a third intermittent stream before the stream exits the parcel flowing north. Ponded water was observed in the drainage feature during an IT site walk, February 2000, however, there was not any flow observed.

Several circular surface depressions (approximately five to six feet in diameter) were observed on the east-facing slope, near the east-central portion of the site. Additional surface depressions were noted near a topographic low adjacent to the surface drainage feature near the east-central portion of the parcel, and at a topographic high location near the west central portion of the parcel. Surface debris (tires, rusted beverage cans, soda bottles) were observed in the extreme southeast corner of the study area during the site walk.

Area M2 is a subsection of Parcel 232Q-X. Parcel 232Q-X includes all areas that are not otherwise designated south of Summerall Gate Road, north of known ranges east and west of Iron Mountain Road, east of the Main Post boundary, and west of the Motor Pool 3100, Parcel

146(7). This includes several other parcels within Parcel 232Q-X such as Area M2, the Former Weapons Demonstration Area, Parcel 194(7), and Training Area T4, the Former Biological Simulant Test Area, Parcel 181(7).

The closest parcel to Area M2 is the Former Weapons Demonstration Area, Parcel 194(7). This parcel is located along the eastern border of Area M2 within the overall Parcel 232Q-X. Parcel 194 (7) was reportedly used in the 1950s for familiarization training with various munitions. Munitions demonstrated include the following:

- Flame throwers
- Smoke grenades
- Rifle smoke grenades
- Thermite grenades
- X-200 land mines filled with 5 gallons of napalm
- M5 and M4A2 Navy floating smoke generators
- Primacord
- White phosphorus
- M1 land mine filled with molasses residuum (innocuous simulant for mustard agent)
- FFE (field flame expedient).

There is not any evidence of chemical warfare agents being used in the former Weapons Demonstration Area, Parcel 194(7). Parcel 194(7) appears cleared and the site of intense activity on aerial photographs taken in 1957. Due to the proximity of Parcel 194(7) to Area M2, similar weapons demonstration activities may have occurred at Area M2.

Specifically, IT will collect 14 surface soil samples, 14 subsurface soil samples, 5 surface water samples, and 5 sediment samples at this site. Potential contaminant sources at Area M2, Subsection of Area 45, are primarily unknown, but may include lead and nitroexplosives. Chemical analyses of the samples collected during the field program will include volatile organic compounds, semivolatile organic compounds, metals, nitroexplosives, and perchlorate. In

addition, the sediment samples will be analyzed for total organic carbon and grain size. Results from these analyses will be compared with site-specific screening levels developed in the Draft Risk Assessment and Background Data Summary Report, March 2000, and regulatory agency guidelines.

Area M2, Subsection of Area 45, does not fall within the "Possible Explosive Ordnance Impact Areas" or "Possible Artillery Impact Areas" shown on Plate 10 of the FTMC Archive Search Report Maps, June, 1998; however, based on the recommendation by USACE-Huntsville, unexploded ordnance (UXO) surface sweeps and downhole surveys of soil borings will be required to support field activities at Area M2, Subsection of Area 45. The Base Realignment and Closure Cleanup Team is aware of local anecdotal evidence that ordnance may be potentially present at Area M2. The surface sweeps and downhole surveys will be conducted to identify anomalies for the purposes of UXO avoidance.

This SFSP attachment to the installation-wide sampling and analysis plan (SAP) for Area M2, Subsection of Area 45, will be used in conjunction with the site-specific safety and health plan (SSHP), the installation-wide work plan, and the SAP. The SAP includes the installation-wide safety and health plan, waste management plan, and quality assurance plan. Site-specific hazard analyses are included in the SSHP.

1.0 Project Description

1.1 Introduction

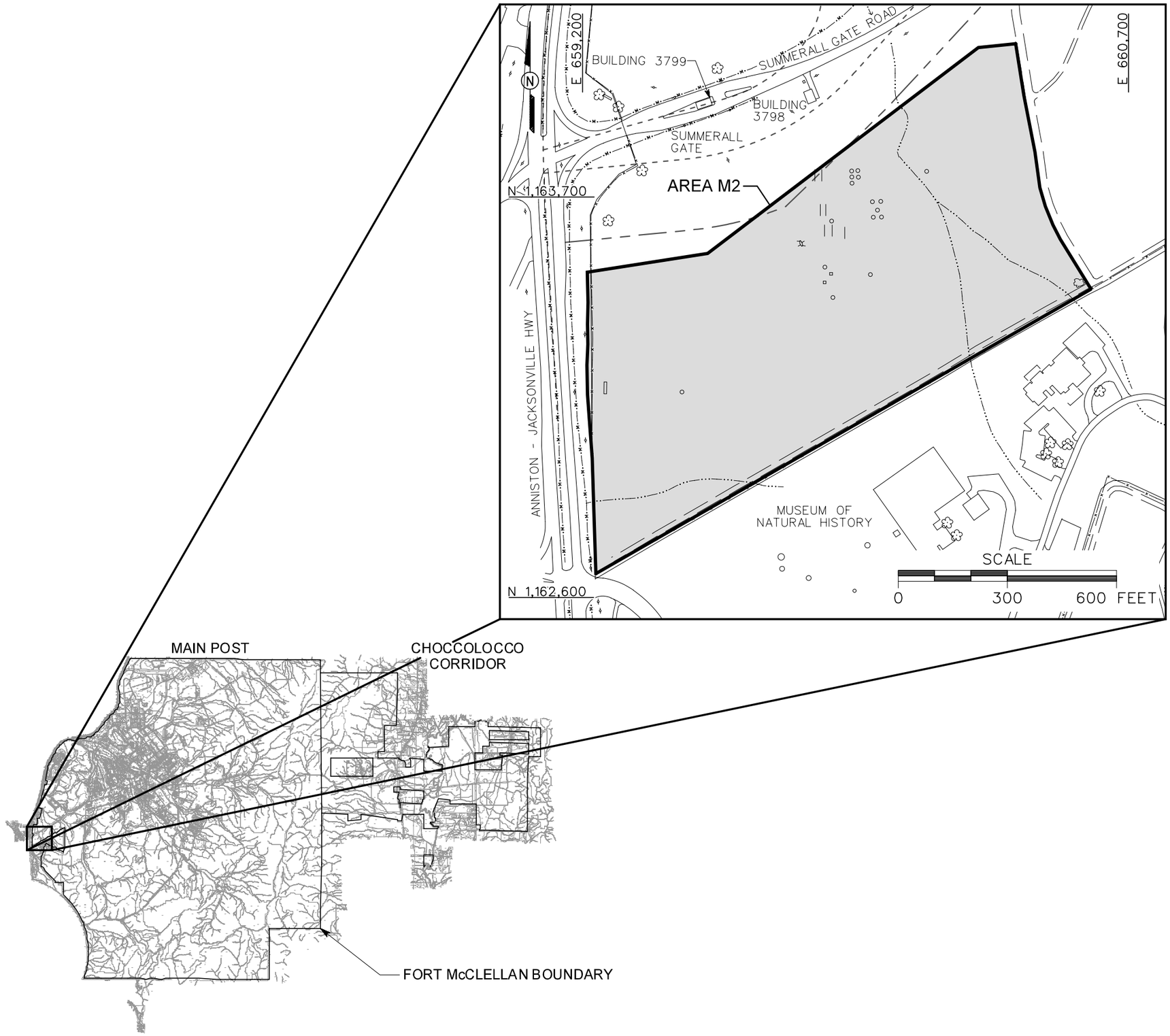
The U.S. Army is conducting studies of the environmental impact of suspected contaminants at Fort McClellan (FTMC) in Calhoun County, Alabama, under the management of the U.S. Army Corps of Engineers (USACE)-Mobile District. At the request of the U.S. Army, IT Corporation (IT) has been requested to conduct fast-track site investigation (SI) activities at Area M2, Subsection of Area 45, at FTMC, Calhoun County, Alabama, to determine the presence or absence of potential site-specific chemicals at this site for potential quick release of the property by the U.S. Army. The area of this parcel was specified by the FTMC Transition Force. IT will conduct SI activities in accordance with Contract No. DACA21-96-D-0018, Task Order CK04.

This site-specific field sampling plan (SFSP) attachment to the installation-wide sampling and analysis plan (SAP) (IT, 1998a) for FTMC has been prepared to provide technical guidance for sample collection and analysis at Area M2, Subsection of Area 45. This SFSP will be used in conjunction with the site-specific safety and health plan (SSHP) developed for Area M2, Subsection of Area 45, and the installation-wide work plan (WP) (IT, 1998b) and SAP. The SAP includes the installation-wide safety and health plan (SHP), waste management plan, and quality assurance plan (QAP). Site-specific hazard analyses are included in the SSHP.

1.2 Site Description

Area M2, Subsection of Area 45, is a 20.23-acre area approximately 400 feet south-southeast of the Summerall Gate and Summerall Gate Road, east of the Anniston-Jacksonville highway and adjacent to the western Main Post boundary (Figure 1-1). The parcel is bounded to the south and east by a service road. A chain link fence extends along the southern parcel boundary.

The overall elevation of Area M2 ranges from about 780 to 860 feet mean sea level (msl), with the highest elevation near the center of the parcel and sloping to both the east and west. Shallow groundwater flow probably follows site topography, with movement toward the northeast and east and somewhat to the west. A surface drainage feature crosses the southwest corner of the parcel with a west flow direction. Also, two small intermittent streams converge at the east end of the parcel flowing north and merge with a third intermittent stream before the stream exits the parcel flowing north (Figure 1-2). Ponded water was observed in the drainage feature during an IT site walk, February 2000, however, there was not any flow observed.



LEGEND

- UNIMPROVED ROADS AND PARKING
- PAVED ROADS AND PARKING
- BUILDING
- TREES / TREELINE
- PARCEL BOUNDARY
- BRIDGE
- CULVERT WITH HEADWALL
- SURFACE DRAINAGE / CREEK
- MANMADE SURFACE DRAINAGE FEATURE
- FENCE
- RAILROAD
- UTILITY POLE
- SURFACE MOUND
- SURFACE DEPRESSIONS (5-6' IN DIAMETER AND 3-4' DEEP)
- TRENCH LOCATION (12-18' IN LENGTH AND 1-3' DEEP)
- EASTERN BYPASS RIGHT OF WAY BOUNDARY
- EASTERN BYPASS PROPOSED ROADWAY

FIGURE 1-1
SITE LOCATION MAP
AREA M2, SUBSECTION OF AREA 45

U. S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
FORT McCLELLAN
CALHOUN COUNTY, ALABAMA
Contract No. DACA21-96-D-0018

IT CORPORATION
A Member of The IT Group

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E 659,300

E 661,100

E 662,900

N 1,165,400

N 1,164,000

N 1,162,600

EASTERN BYPASS RIGHT OF WAY

EASTERN BYPASS PROPOSED ROADWAY

SUMMERALL GATE ROAD

PARCEL 181(7)

PARCEL 194(7)

SUMMERALL GATE

AREA M2

TWO DS 2 CANS

SURFACE DEBRIS

ATHLETIC FIELD

WOODS

MUSEUM OF NATURAL HISTORY

WATER

PARKING

PARKING

FLOW

FLOW

FLOW

3798

3799

LEGEND

- UNIMPROVED ROADS AND PARKING
- PAVED ROADS AND PARKING
- BUILDING
- TOPOGRAPHIC CONTOURS (CONTOUR INTERVAL - 5 FEET)
- TREES / TREELINE
- PARCEL BOUNDARY
- SURFACE DRAINAGE / CREEK
- MANMADE SURFACE DRAINAGE FEATURE
- FENCE
- RAILROAD
- UTILITY POLE
- SURFACE MOUND
- SURFACE DEPRESSIONS (5-6' IN DIAMETER AND 3-4' DEEP)
- TRENCH LOCATION (12-18' IN LENGTH AND 1-3' DEEP)
- DS 2 DECONTAMINATION SOLUTION NO. 2
- EASTERN BYPASS RIGHT OF WAY BOUNDARY
- EASTERN BYPASS PROPOSED ROADWAY

SCALE

0 400 800 FEET

FIGURE 1-2
SITE MAP
AREA M2, SUBSECTION OF AREA 45

U. S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
FORT McCLELLAN
CALHOUN COUNTY, ALABAMA
Contract No. DACA21-96-D-0018

IT CORPORATION
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INITIATOR: J. JENKINS | PROJ. MGR.: J. YACOUB
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Several circular surface depressions (approximately five to six feet in diameter) were observed on the east-facing slope, near the east-central portion of the site. Additional surface depressions were noted near a topographic low adjacent to the surface drainage feature near the east-central portion of the parcel, and at a topographic high location near the west central portion of the parcel. Surface debris (tires, rusted beverage cans, soda bottles, etc.) were observed in the extreme southeast corner of the study area during the site walk.

Area M2 is a subsection of the Parcel 232Q-X. Parcel 232Q-X includes all areas south of Summerall Gate Road, north of known ranges east and west of Iron Mountain Road, east of the Main Post boundary, and west of the Motor Pool 3100, Parcel 146(7). This includes several other parcels within Parcel 232Q-X such as Area M2, the Former Weapons Demonstration Area, Parcel 194(7), and Training Area T4, the Former Biological Simulant Test Area, Parcel 181(7) (Figure 1-2).

The closest parcel to Area M2 is the Former Weapons Demonstration Area, Parcel 194(7). This parcel is located along the eastern border of Area M2 within the overall Parcel 232Q-X. Parcel 194 (7) was reportedly used in the 1950s for familiarization training with various munitions (Environmental Sciences and Engineers, Inc. [ESE], 1998). Munitions demonstrated include the following (ASR, 1999):

- Flame throwers
- Smoke grenades
- Rifle smoke grenades
- Thermite grenades
- X-200 land mines filled with 5 gallons of napalm
- M5 and M4A2 Navy floating smoke generators
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- White phosphorus
- M1 land mine filled with molasses residuum (innocuous simulant for mustard agent)
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There is not any evidence of chemical warfare agents being used in the former Weapons Demonstration Area, Parcel 194(7) (ASR, 1999). Parcel 194(7) appears cleared and the site of intense activity on aerial photographs taken in 1957 (ASR, 1999). Due to the proximity of Parcel 194(7) to Area M2, similar weapons demonstration activities may have occurred at Area M2.

The soils at Area M2, Subsection of Area 45, fall into Anniston and Allen gravelly loams, 6 to 10 percent slopes, eroded (AcC2) and the Anniston and Allen gravelly loams, 15 to 25 percent slopes, eroded (AcE2) (U.S. Department of Agriculture [USDA], 1961). The soils on the east and west ends of the site are AcE2 and the soils through the middle of the parcel are AcE2.

The Anniston and Allen series of soils consists of strongly acid, deep well-drained soils that have developed in old local aluvium. The parent material washed from the adjacent higher lying Linker, Muskingum, Enders, and Montevallo soils, which developed from, weathered sandstone, shale, and quartzite. The surface sandstone and quartzite gravel and cobbles, as much as 8 inches in diameter, are on the surface and throughout the soil. The depth to bedrock at these sites ranges from 2 feet to greater than 10 feet. The depth to the water table is likely greater than 20 feet. The typical soil description is 2 to 10 feet of well-drained stony loam to clay loam over stratified local alluvium, limestone or shale bedrock. Shallow groundwater direction at the site is probably controlled by topography.

Soils in the middle of the site from north to south fall into the AcC2 (USDA, 1961). This mapping unit consists of friable soils that have developed in old alluvium on foot slopes and along the base of mountains. The color of the surface soil ranges from very dark brown and dark brown to reddish brown and dark reddish brown. The texture of subsoil ranges from light clay loam to clay or silty clay loam. The alluvium ranges in thickness from 2 to more than 8 feet. Infiltration and runoff are medium, permeability is moderate, and the capacity for available moisture is high. Organic matter is moderately low. Some severely eroded areas may be common on the surface for the AcC2 soil type, as well as a few shallow gullies.

Soils across the east and north ends of the site fall into the Anniston and Allen gravelly loams, 15 to 25 percent slopes, eroded (AcE2) (USDA, 1961). This mapping unit consists of surface soil that is very dark brown to very dark grayish–brown gravelly loam, 6 to 8 inches thick. In many places, severely eroded patches and shallow gullies are common. The plow layer is reddish-brown to dark reddish-brown gravelly clay loam.

1.3 Scope of Work

The scope of work for activities associated with the site investigation at Area M2, Subsection of Area 45, as specified in the statement of work, includes the following tasks:

- Develop the SFSP attachment.
- Develop the SSHP attachment.
- Conduct a surface and near-surface unexploded ordnance (UXO) survey over all areas to be included in the supplemental sampling effort.
- Provide downhole UXO support for all intrusive drilling to determine buried downhole hazards.
- Collect 14 surface soil samples, 14 subsurface soil samples, 5 surface water samples, and 5 sediment samples to determine whether potential site-specific chemicals (PSSC) are present at Area M2, Subsection of Area 45, and to provide data useful for supporting any future planned corrective measures and closure activities.
- Samples will be analyzed for the parameters listed in Section 4.5.

Area M2, Subsection of Area 45, does not fall within the "Possible Explosive Ordnance Impact Areas" or "Possible Artillery Impact Areas" shown on Plate 10 of the FTMC Archive Search Report Maps, June, 1998; however, based on the recommendation by USACE-Huntsville, UXO surface sweeps and downhole surveys of soil borings will be required to support field activities at Area M2, Subsection of Area 45. The Base Realignment and Closure Cleanup Team (BCT) is aware of local anecdotal evidence that ordnance may potentially be present at Area M2. The surface sweeps and downhole surveys will be conducted to identify anomalies for the purposes of UXO avoidance.

Upon completion of the field activities and sample analyses, draft and final reports will be prepared to summarize the results of the activities, and to evaluate the absence or presence of PSSCs at this site, and to recommend further actions, if appropriate. SI summary reports will be prepared in accordance with current U.S. Environmental Protection Agency (EPA) Region IV and the Alabama Department of Environmental Management (ADEM) guidelines.

2.0 Summary of Existing Environmental Studies

An environmental baseline survey (EBS) was conducted by ESE to document current environmental conditions of all FTMC property (ESE, 1998). The study was to identify sites that, based on available information, have no history of contamination and comply with U.S. Department of Defense (DOD) guidance for fast-track cleanup at closing installations. The EBS also provides a baseline picture of FTMC properties by identifying and categorizing the properties by seven criteria.

1. Areas where no storage, release, or disposal (including migration) has occurred.
2. Areas where only release or disposal of petroleum products has occurred.
3. Areas of contamination below action levels.
4. Areas where all necessary remedial actions have been taken.
5. Areas of known contamination with removal and/or remedial action underway.
6. Areas of known contamination where required response actions have not been taken.
7. Areas that are not evaluated or require further evaluation.

For non-Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) environmental or safety issues, the parcel label includes the following components: a unique non-CERCLA issue number, the letter "Q" designating the parcel as a Community Environmental Response Facilitation Act (CERFA) Category 1 Qualified Parcel, and the code for the specific non-CERCLA issue(s) present (ESE, 1998). The non-CERCLA issue codes used are:

- A = Asbestos (in buildings)
- L = Lead-based paint (in buildings)
- P = Polychlorinated biphenyls (PCB)
- R = Radon (in buildings)
- RD = Radionuclides/radiological issues
- X = Unexploded ordnance
- CWM = Chemical warfare material.

The EBS was conducted in accordance with the CERFA (CERFA-Public Law 102-426) protocols and DOD policy regarding contamination assessment. Record searches and reviews

were performed on all reasonably available documents from FTMC, ADEM, EPA Region IV, and Calhoun County, as well as a database search of Comprehensive Environmental Response, Compensation, and Liability Act-regulated substances, petroleum products, and Resource Conservation and Recovery Act-regulated facilities. Available historic maps and aerial photographs were reviewed to document historic land uses. Personal and telephone interviews of past and present FTMC employees and military personnel were conducted. In addition, visual site inspections were conducted to verify conditions of specific property parcels.

Area M2, Subsection of Area 45, was identified as a Category 1 CERFA site, qualified "X" for UXO. This CERFA site is a parcel where no known or recorded storage, release, or disposal (including migration) has occurred on site property, but is qualified for potential UXO. Area M2, Subsection of Area 45, also requires additional evaluation to determine its environmental condition.

3.0 Site-Specific Data Quality Objectives

3.1 Overview

The data quality objective (DQO) process is followed to establish data requirements. This process ensures that the proper quantity and quality of data are generated to support the decision-making process associated with the action selection for Area M2, Subsection of Area 45. This section incorporates the components of the DQO process described in the publication EPA 540-R-93-071, *Data Quality Objectives Process for Superfund* (EPA, 1993). The DQO process as applied to Area M2, Subsection of Area 45, is described in more detail in Section 4.3 of the WP. Table 3-1 provides a summary of the factors used to determine the appropriate quantity of samples, and the procedures necessary to meet the objectives of the SI and establish a basis for future action at this site.

The samples will be analyzed using EPA SW-846 methods, including Update III Methods where applicable, as presented in Chapter 4.0 in this SSFP and Table 6-1 in the QAP. Data will be reported and evaluated in accordance with Corps of Engineers South Atlantic Savannah (CESAS) Level B criteria (USACE, 1994) and the stipulated requirements for the generation of definitive data (Section 3.1.2 of the QAP). Chemical data will be reported via hard copy data packages by the laboratory using Contract Laboratory Program (CLP)-like forms. These packages will be validated in accordance with EPA National Functional Guidelines by Level III criteria.

3.2 Data Users and Available Data

The available data, presented in Table 3-1, related to the SI at Area M2, Subsection of Area 45, have been used to formulate a site-specific conceptual model. This conceptual model was developed to support the development of this SFSP, which is necessary to meet the objectives of these activities and to establish a basis for future action at the site. The data users for the data and information generated during field activities are primarily EPA, USACE, ADEM, FTMC, and the USACE supporting contractors. This SFSP, along with the necessary companion documents, has been designed to provide the regulatory agencies with sufficient detail to reach a determination as to the adequacy of the scope of work. The program has also been designed to provide the level of defensible data and information required to confirm or rule out the existence of residual chemical contamination in site media.

Table 3-1

Summary of Data Quality Objectives
Site Investigation
Area M2, Subsection of Area 45
Fort McClellan, Calhoun County, Alabama

Potential Data Users	Available Data	Conceptual Site Model	Media of Concern	Data Uses and Objectives	Data Types	Analytical Level	Data Quantity
EPA, ADEM USACE, DOD FTMC, IT Corporation Other contractors, and possible future land users	None	Contaminant Source Area M2, Subsection of Area 45 Migration Pathways Infiltration to subsurface soil, dust emissions and volatilization to ambient air, biotransfer to deer through browsing, and runoff and erosion to surface water and sediment Potential Receptors Groundskeepers (future), construction workers (future), recreational site user (future), and residents (future). PSSC metals and explosives	Surface soil Subsurface Soil Surface Water Sediment	SI to confirm the presence or absence of contamination in the site media Definitive quality data for future decision-making	Surface soil TCL VOCs, TCL SVOCs, TAL Metals, and Nitroexplosives, Perchlorate	Definitive data in CESAS Level B data packages	14 direct-push soil samples + QC
					Subsurface Soil TCL VOCs, TCL SVOCs, TAL Metals, and Nitroexplosives, Perchlorate	Definitive data in CESAS Level B data packages	14 direct-push soil samples + QC
					Surface Water TCL VOCs, TCL SVOCs, TAL Metals, and Nitroexplosives, Perchlorate	Definitive data in CESAS Level B data packages	5 surface water samples + QC
					Sediment TCL VOCs, TCL SVOCs, TAL Metals, Nitroexplosives, Perchlorate, TOC, and Grain Size,	Definitive data in CESAS Level B data packages	5 sediment samples + QC

ADEM - Alabama Department of Environmental Management.
CESAS - Corps of Engineers South Atlantic Savannah.
DOD - U.S. Department of Defense.
EPA - U.S. Environmental Protection Agency.
FTMC - Fort McClellan.
QC - Quality control.
SI - Site inspection.
SVOC - Semivolatile organic compound.
TAL - Target analyte list.
TCL - Target compound list.
TOC - Total organic carbon.
USACE - U.S. Army Corps of Engineers.
VOC - Volatile organic compound.

3.3 Conceptual Site Model

The conceptual site exposure model (CSEM) provides the basis for identifying and evaluating potential risks to human health in the risk assessment. The CSEM includes receptors and potential exposure pathways appropriate to all plausible scenarios. The CSEM facilitates consistent and comprehensive evaluation of risk to human health through graphically presenting all possible exposure pathways, including sources, release and transport pathways, and exposure routes. In addition, the CSEM helps to ensure that potential pathways are not overlooked. The elements of a complete exposure pathway and CSEM are:

- Source (i.e., contaminated environmental) media
- Contaminant release mechanisms
- Contaminant transport pathways
- Receptors
- Exposure pathways.

Contaminant release mechanisms and transport pathways are not relevant for direct receptor contact with a contaminated source medium.

Primary contaminant releases were probably limited to leaks and spills that entered surface soil. Potential contaminant transport pathways include infiltration and leaching to subsurface soil, dust emissions and volatilization to ambient air, biotransfer to deer through browsing, surface water runoff, and erosion to surface water and sediment. Leaching to groundwater is not anticipated to be a potential contaminant transport pathway because the site history indicates that only explosives were used at the site; it is not expected that explosive breakdown products would leach to groundwater (approximately 20 feet bgs).

Currently the site is not used and access is restricted; most of the site is undeveloped. It is not thought that the site is currently maintained in any fashion. Therefore, there are no plausible receptors with the current land-use. The streams on site are too small to support fish and since access is restricted, hunting is not feasible. Other potential receptors considered, but not included under current land-use scenarios, are the:

- ***Groundskeeper.*** The site is not currently maintained by a groundskeeper.
- ***Construction Worker.*** The site is unused, and no development or construction is occurring.
- ***Resident.*** The site is not currently used for residential purposes.

- ***Recreational Site User.*** The site is fenced on the eastern and southern sides, while access is restricted to the base through the Summerall Gate north of the site, thus no recreational site users would be allowed on site currently.

Future land-use in this area will most likely be commercial and/or industrial, however it has been designated as unrestricted use. The site may not be deemed safe for public access until remediation has been completed because of the potential for UXO (FTMC, 1997). Since the site use has been designated as unrestricted, any future land-use receptor scenarios are plausible. Thus the following receptor scenarios in the CSEM include:

- ***Resident.*** Although the site is expected to be utilized for commercial or industrial purposes, the residential scenario is considered in order to provide information for the project manager and regulators.

- ***Groundskeeper.*** The site is likely to have areas that will need to be maintained, such as around parking lots and buildings.

- ***Construction Worker.*** The site is expected to be developed in the near future, thus this receptor is evaluated.

- ***Recreational Site User.*** Although the site will most likely be utilized for commercial or industrial purposes, since it is listed as unrestricted use, the recreational site user must be included. His exposure to sediment and surface water will be evaluated. Fishing will not be included as a pathway since the streams on site are too small to support fish. Hunting will be included as a potential exposure pathway since the site is currently wooded and future land-use is listed as unrestricted.

A summary of relevant contaminant release and transport mechanisms, source and exposure media, and receptors and exposure pathways for this site is provided in Table 3-1 and Figure 3-1.

3.4 Decision-Making Process, Data Uses, and Needs

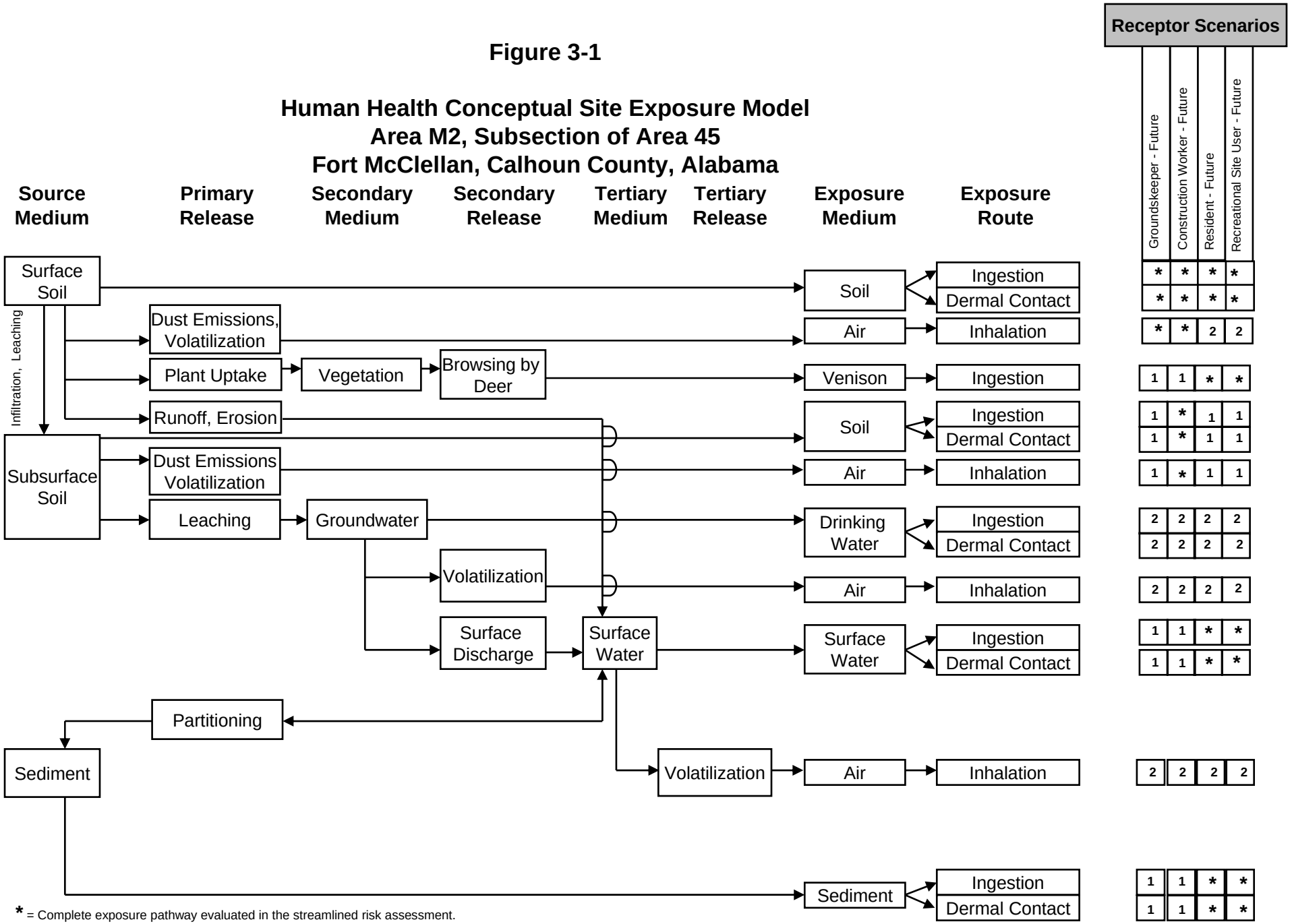
The decision-making process consists of a seven-step process that is presented in detail in Section 4.3 of the WP and will be followed during the site investigation at Area M2, Subsection of Area 45. Data uses and needs are summarized in Table 3-1.

3.4.1 Risk Evaluation

Confirmation of contamination at Area M2, Subsection of Area 45, will be based on using EPA definitive data with CESAS Level B data packages to determine whether or not PSSCs are detected in site media. Detected site chemical concentrations will be compared to site-specific screening levels developed in the Draft Risk Assessment and Background Data Summary

Figure 3-1

Human Health Conceptual Site Exposure Model
Area M2, Subsection of Area 45
Fort McClellan, Calhoun County, Alabama



***** = Complete exposure pathway evaluated in the streamlined risk assessment.
1 = Incomplete exposure pathway.
2 = Although theoretically complete, this pathway is judged to be insignificant and is not evaluated in the streamlined risk assessment.

Report, March 2000. Definitive data will be adequate for confirming the presence of site contamination and for supporting a feasibility study and risk assessment.

Assessment of potential ecological risk associated with sites or parcels (e.g., surface water and sediment sampling, specific ecological assessment methods, etc.) will be addressed in accordance with the procedures in the WP.

3.4.2 Data Types and Quality

Surface soil, subsurface soil, surface water and sediment samples will be sampled and analyzed to meet the objectives of the SI at Area M2, Subsection of Area 45. Quality assurance/quality control (QA/QC) samples will be collected for all sample types as described in Chapter 4.0 of this SFSP. The samples will be analyzed by EPA-approved SW-846 methods, where available; comply with EPA definitive data requirements; and be reported using hard copy data packages. In addition to meeting the quality needs of this SI, data analyzed at this level of quality are appropriate for all phases of site characterization, remedial investigation, and risk assessment.

3.4.3 Precision, Accuracy, and Completeness

Laboratory requirements of precision, accuracy, and completeness for this site investigation are provided in Section 9.0 of the QAP.

4.0 Field Activities

4.1 UXO Survey Requirements and Utility Clearances

Area M2, Subsection of Area 45, does not fall within the "Possible Explosive Ordnance Impact Areas" or "Possible Artillery Impact Areas" shown on Plate 10 of the FTMC Archive Search Report Maps, June, 1998; however, based on the recommendation by USACE-Huntsville, UXO surface sweeps and downhole surveys of soil borings will be required to support field activities at Area M2, Subsection of Area 45. The BCT is aware of local anecdotal evidence that ordnance may potentially be present at Area M2. The surface sweeps and downhole surveys will be conducted to identify anomalies for the purposes of UXO avoidance.

4.1.1 Surface UXO Survey

A UXO sweep will be conducted over areas that will be included in the sampling and surveying activities to identify UXO on or near the surface that may present a hazard to on-site workers during field activities. Low-sensitivity magnetometers will be used to locate surface and shallow-buried metal objects. UXO located on the surface will be identified and conspicuously marked for each avoidance. Subsurface metallic anomalies will not be disturbed, and will also be marked for easy avoidance. UXO personnel requirements, procedures, and detailed descriptions of the geophysical equipment to be used are provided in Chapter 4.0 and Appendices D and E of the approved SAP (IT, 1998a).

4.1.2 Downhole UXO Survey

During the soil boring and downhole sampling, downhole UXO surveys will be performed to determine if buried metallic objects are present. UXO monitoring, as described in Chapter 4.0 of the SAP (IT, 1998a), will continue until undisturbed soils are encountered or the borehole has been advanced to 12 feet below ground surface (bgs), whichever is reached first.

4.1.3 Utility Clearances

After the UXO surface survey has cleared the area to be sampled and prior to performing any intrusive sampling, a utility clearance will be performed at locations where soil samples will be collected, using the procedure outlined in Section 4.2.6 of the SAP (IT, 1998a). The site manager will mark the proposed locations with stakes, coordinate with the appropriate local utility companies to clear the proposed locations for utilities, and obtain digging permits. Once the locations are approved (for both UXO and utility avoidance) for intrusive sampling, the stakes will be labeled as cleared.

4.2 Environmental Sampling

The environmental sampling program at Area M2, Subsection of Area 45, includes the collection of surface soil, subsurface soil, surface water, and sediment samples for chemical analyses. These samples will be collected and analyzed to provide data for characterizing the site to determine the environmental condition of the site and any further action to be conducted at the site.

4.2.1 Surface Soil Sampling

Surface soil samples will be collected from 14 soil locations at Area M2, Subsection of Area 45.

4.2.1.1 Sample Locations and Rationale

The surface soil sampling rationale are listed in Table 4-1. Proposed sampling locations are shown in Figure 4-1. Surface soil sample designations and required QA/QC sample requirements are summarized in Table 4-2. The final soil boring sampling locations will be determined in the field by the on-site geologist, based on actual field conditions.

4.2.1.2 Sample Collection

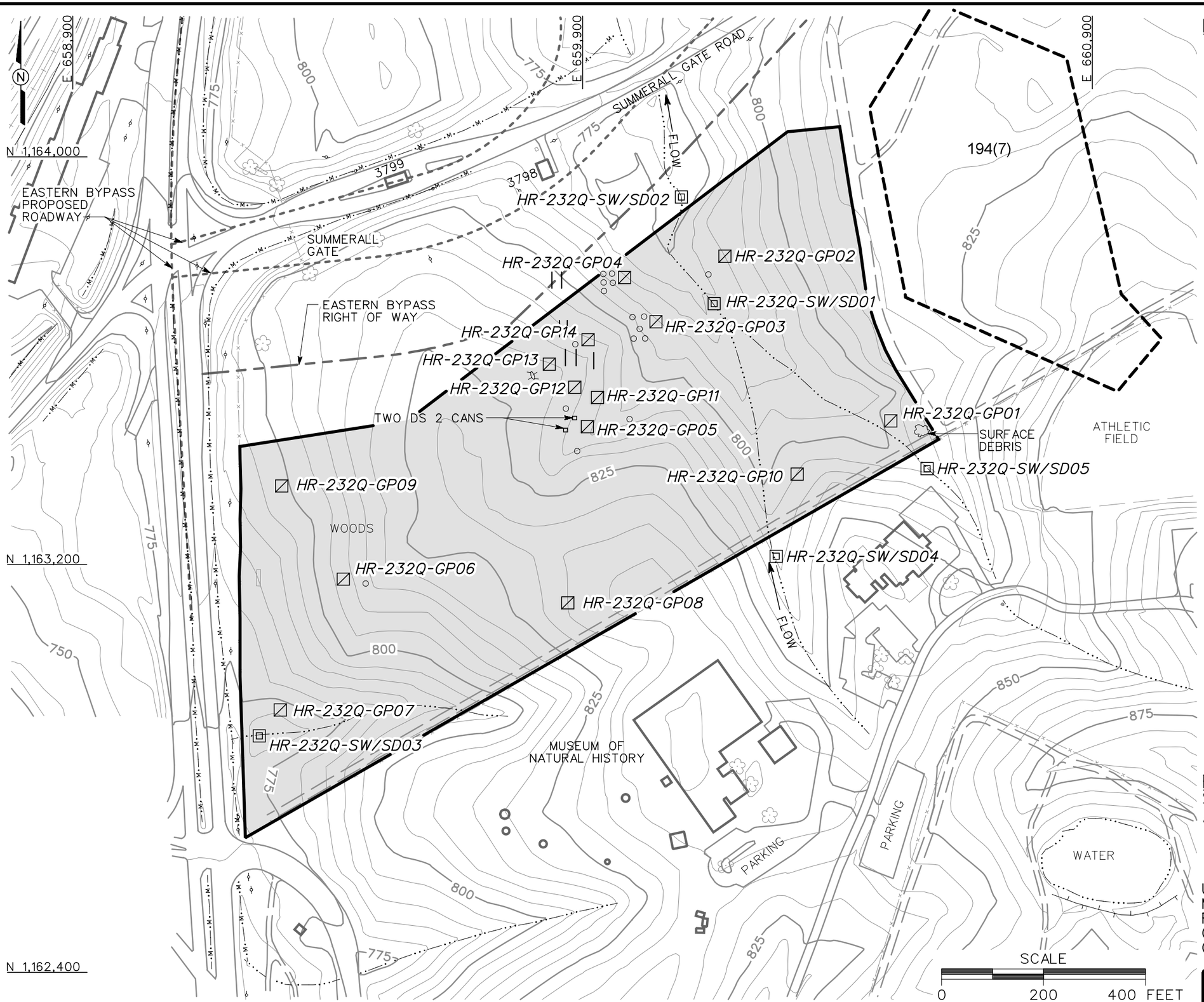
Surface soil samples will be collected from the upper 1 foot of soil by direct-push methodology as specified in Section 4.7.1.1 of the SAP (IT, 1998a). Collected soil samples will be screened using a photoionization detector (PID) in accordance with Section 4.15 of the SAP. Surface soil samples will be screened for information purposes only, and not to select samples for analysis. Sample containers, sample volumes, preservatives, and holding times for the analyses required in this SFSP are listed in Section 5.0, Table 5-1, of the QAP. Sample documentation and chain-of-custody will be recorded as specified in Section 4.13 of the SAP. The samples will be analyzed for the parameters listed in Section 4.5 of this SFSP.

4.2.2 Subsurface Soil Sampling

Subsurface soil samples will be collected from the 14 soil borings installed at Area M2, Subsection of Area 45.

4.2.2.1 Sample Locations and Rationale

Subsurface soil samples will be collected from the soil borings proposed on Figure 4-1. The subsurface soil sampling rationale is listed in Table 4-1. Subsurface soil samples to be collected are listed in Table 4-2. The final soil boring sampling locations will be determined in the field by the on-site geologist, based on actual field observations and utility clearance results.



LEGEND

- UNIMPROVED ROADS AND PARKING
- PAVED ROADS AND PARKING
- BUILDING
- TOPOGRAPHIC CONTOURS (CONTOUR INTERVAL - 5 FEET)
- TREES / TREELINE
- PARCEL BOUNDARY
- SURFACE DRAINAGE / CREEK
- MANMADE SURFACE DRAINAGE FEATURE
- FENCE
- RAILROAD
- UTILITY POLE
- PROPOSED SURFACE AND SUBSURFACE SOIL SAMPLE LOCATION
- PROPOSED SURFACE WATER/SEDIMENT SAMPLE LOCATION
- SURFACE MOUND
- SURFACE DEPRESSIONS (5-6' IN DIAMETER AND 3-4' DEEP)
- TRENCH LOCATION (12-18' IN LENGTH AND 1-3' DEEP)
- DS — DECONTAMINATION SOLUTION NO. 2 CANS
- EASTERN BYPASS RIGHT OF WAY BOUNDARY
- EASTERN BYPASS PROPOSED ROADWAY

FIGURE 4-1
SAMPLE LOCATION MAP
AREA M2, SUBSECTION OF AREA 45

U. S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
FORT McCLELLAN
CALHOUN COUNTY, ALABAMA
Contract No. DACA21-96-D-0018

IT CORPORATION
A Member of The IT Group

DWG. NO.: ...\77319es.096 | PROJ. NO.: 773191
INITIATOR: J. JENKINS | PROJ. MGR.: J. YACOUB
DRAFT. CHCK. BY: | ENGR. CHCK. BY: J. JENKINS
DATE LAST REV.: | DRAWN BY:
STARTING DATE: 02/25/00 | DRAWN BY: D. BILLINGSLEY
12/06/00 04:11:22
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Table 4-1

Sampling Locations and Rationale
Area M2, Subsection of Area 45
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Media	Sample Location Rationale
HR-232Q-GP01	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be placed downslope of surface debris near the southeast corner of the parcel. Sample data will indicate if contaminant releases into the environment have occurred from use of this area and if contaminated soil exists at this site. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
HR-232Q-GP02	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be placed adjacent to a surface depression east of the north-south trending surface drainage feature. Sample data wil indicate if contaminant releases into the environment have occurred from use of this area and if contaminated soil exists at this site. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
HR-232Q-GP03	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be placed downslope of a group of surface depressions west of the north-south trending surface drainage feature. Sample data will indicate if contaminant releases into the environment have occurred from use of this area and if contaminated soil exists at this site. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
HR-232Q-GP04	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be placed downslope of two surface depressions near the north-central portion of the parcel. Sample data will indicate if contaminant releases into the environment have occurred from use of this area and if contaminated soil exists at this site. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
HR-232Q-GP05	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be placed downslope of a surface depression in the north-central portion of the parcel. Sample data will indicate if contaminant releases into the environment have occurred from use of this area and if contaminated soil exists at this site. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
HR-232Q-GP06	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be placed downslope of a surface depression in the west-central portion of the parcel. Sample data will indicate if contaminant releases into the environment have occurred from use of this area and if contaminated soil exists at this site. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
HR-232Q-GP07	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be placed at a topographic low location near the southwest corner of the parcel. Sample data will indicate if contaminant releases into the environment have occurred from use of this area and if contaminated soil exists at this site. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
HR-232Q-GP08	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be placed near the south-central parcel boundary. Sample data will indicate if contaminant releases into the environment have occurred from use of this area and if contaminated soil exists at this site. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
HR-232Q-GP09	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be placed near the north western corner of the parcel. Sample data will indicate if contaminant releases into the environment have occurred from use of this area and if contaminated soil exists at this site. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
HR-232Q-GP10	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be placed near the southeastern parcel boundary. Sample data will indicate if contaminant releases into the environment have occurred from use of this area and if contaminated soil exists at this site. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
HR-232Q-GP11	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be placed in the southern trench in the north central area of the site. Sample data will indicate if contaminant releases into the environment have occurred from use of this area and if contaminated soil exists at this site. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
HR-232Q-GP12	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be placed in the northern trench in the north central area of the site. Sample data will indicate if contaminant releases into the environment have occurred from use of this area and if contaminated soil exists at this site. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
HR-232Q-GP13	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be placed in the trench east of the mound in the north central area of the site. Sample data will indicate if contaminant releases into the environment have occurred from use of this area and if contaminated soil exists at this site. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
HR-232Q-GP14	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be placed in the trench east of the depression in the north central area of the site. Sample data will indicate if contaminant releases into the environment have occurred from use of this area and if contaminated soil exists at this site. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.

Table 4-1

Sampling Locations and Rationale
Area M2, Subsection of Area 45
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Media	Sample Location Rationale
HR-232Q-SW/SD01	Surface water, and Sediment	Sample location is downstream of the confluence of the two small intermittent streams that merge and flow north in the eastern section of the site. Sample data will indicate if contaminant releases have occurred from runoff in this area of the site of Area M2. Sample data will also be used to assess potential impacts to aquatic biota in the stream and other ecological receptors that may utilize that stream for food and/or habitat purposes.
HR-232Q-SW/SD02	Surface water, and Sediment	Sample location is at the north edge of the parcel downstream of the confluences of the three small intermittent streams that merge and flow north in the eastern section of the site. Sample data will indicate if contaminant releases have occurred from runoff in this area of the site of Area M2. Sample data will also be used to assess potential impacts to aquatic biota in the stream and other ecological receptors that may utilize that stream for food and/or habitat purposes.
HR-232Q-SW/SD03	Surface water, and Sediment	Sample location at western boundary of M2 at the Anniston-Jacksonville highway where a small intermittent streams flows west across the southwestern corner of the site. Sample data will indicate if contaminant releases have occurred from runoff in this area of the site of Area M2. Sample data will also be used to assess potential impacts to aquatic biota in the stream and other ecological receptors that may utilize that stream for food and/or habitat purposes.
HR-232Q-SW/SD04	Surface water, and Sediment	Sample location is south of the southern parcel boundary in the western intermittent stream that flows north in the eastern section of the site. Sample data will indicate if contaminants from off-site sources are being transported on-site via surface water pathways. Sample data will also be used to assess potential impacts to aquatic biota in the stream and other ecological receptors that may utilize that stream for food and/or habitat purposes.
HR-232Q-SW/SD05	Surface water, and Sediment	Sample location is south of the southern parcel boundary in the eastern intermittent stream that flows north in the eastern section of the site. Sample data will indicate if contaminants from off-site sources are being transported on-site via surface water pathways. Sample data will also be used to assess potential impacts to aquatic biota in the stream and other ecological receptors that may utilize that stream for food and/or habitat purposes.

Table 4-2

Surface Soil and Subsurface Soil Sample Designations and QA/QC Sample Quantities
Area M2, Subsection of Area 45
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Designation	Sample Depth (ft)	QA/QC Samples			Analytical Suite
			Field Duplicates	Field Splits	MS/MSD	
HR-232Q-GP01	HR-232Q-GP01-SS-EC0001-REG	0-1			HR-232Q-GP01-SS-EC0001-MS/MD	TCL VOCs, TCL SVOCs, TAL Metals, Nitroexplosives, Perchlorate
	HR-232Q-GP01-DS-EC0002-REG	a				
HR-232Q-GP02	HR-232Q-GP02-SS-EC0003-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Nitroexplosives, Perchlorate
	HR-232Q-GP02-DS-EC0004-REG	a				
HR-232Q-GP03	HR-232Q-GP03-SS-EC0005-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Nitroexplosives, Perchlorate
	HR-232Q-GP03-DS-EC0006-REG	a				
HR-232Q-GP04	HR-232Q-GP04-SS-EC0007-REG	0-1	HR-232Q-GP04-SS-EC0008-FD	HR-232Q-GP04-SS-EC0009-FS		TCL VOCs, TCL SVOCs, TAL Metals, Nitroexplosives, Perchlorate
	HR-232Q-GP04-DS-EC0010-REG	a				
HR-232Q-GP05	HR-232Q-GP05-SS-EC0011-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Nitroexplosives, Perchlorate
	HR-232Q-GP05-DS-EC0012-REG	a				
HR-232Q-GP06	HR-232Q-GP06-SS-EC0013-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Nitroexplosives, Perchlorate
	HR-232Q-GP06-DS-EC0014-REG	a				
HR-232Q-GP07	HR-232Q-GP07-SS-EC0015-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Nitroexplosives, Perchlorate
	HR-232Q-GP07-DS-EC0016-REG	a				
HR-232Q-GP08	HR-232Q-GP08-SS-EC0017-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Nitroexplosives, Perchlorate
	HR-232Q-GP08-DS-EC0018-REG	a				
HR-232Q-GP09	HR-232Q-GP09-SS-EC0019-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Nitroexplosives, Perchlorate
	HR-232Q-GP09-DS-EC0020-REG	a				
HR-232Q-GP10	HR-232Q-GP10-SS-EC0021-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Nitroexplosives, Perchlorate
	HR-232Q-GP10-DS-EC0022-REG	a				
HR-232Q-GP11	HR-232Q-GP11-SS-EC0023-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Nitroexplosives, Perchlorate
	HR-232Q-GP11-DS-EC0024-REG	a				
HR-232Q-GP12	HR-232Q-GP12-SS-EC0025-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Nitroexplosives, Perchlorate
	HR-232Q-GP12-DS-EC0026-REG	a			HR-232Q-GP12-DS-EC0026-MS/MSD	
HR-232Q-GP13	HR-232Q-GP13-SS-EC0027-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Nitroexplosives, Perchlorate
	HR-232Q-GP13-DS-EC0028-REG	a	HR-232Q-GP13-DS-EC0029-FD	HR-232Q-GP13-DS-EC0030-FS		
HR-232Q-GP14	HR-232Q-GP14-SS-EC0031-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Nitroexplosives, Perchlorate
	HR-232Q-GP14-DS-EC0032-REG	a				

[a] Actual sample depth selected for analysis will be at the discretion of the site geologist and will be based on field observation.

QA/QC - Quality assurance/quality control.
VOC - Volatile organic compound.
SVOC - Semivolatile organic compound.
TAL - Target analyte list.
TCL - Target compound list.
REG - Field sample.
FD - Field duplicate.
FS - Field split.
MS/MSD - Matrix spike/matrix spike duplicate.

4.2.2.2 Sample Collection

Subsurface soil samples will be collected from soil borings at a depth greater than 1 foot bgs in the unsaturated zone. The soil borings will be advanced and soil samples collected using the direct-push sampling procedures specified in Section 4.7.1.1 of the SAP (IT, 1998a).

Soil samples will be collected continuously for the first 12 feet or until either groundwater or refusal is reached. A detailed lithogical log will be recorded by the on-site geologist for each borehole. At least one subsurface sample from each borehole will be selected for analyses. The collected subsurface soil samples will be field-screened using a PID in accordance with Section 4.15 of the SAP to measure samples exhibiting elevated readings exceeding background (readings in ambient air). Typically, the subsurface soil sample showing the highest reading (above background) will be selected and sent to the laboratory for analysis. If none of the samples indicate readings exceeding background using the PID, the deepest interval from the soil boring will be sampled and submitted to the laboratory for analyses. Subsurface soil samples will be selected for analyses from any depth interval if the on-site geologist suspects PSSCs at the interval. Site conditions such as lithology may also determine the actual sample depth interval submitted for analyses. More than one subsurface soil sample will be collected if field measurements and observations indicate a possible layer of PSSCs and/or additional sample data would provide insight to the existence of any PSSCs.

Sample documentation and chain of custody will be recorded as specified in Section 4.13 of the SAP. Sample containers, sample volumes, preservatives, and holding times for the analyses required in this SFSP are listed in Section 5.0, Table 5-1 of the QAP. The samples will be analyzed for the parameters listed in Section 4.5 of this SFSP.

4.2.3 Surface Water Sampling

Five surface water samples will be collected from the intermittent streams that flow through Area M2, Subsection of Area 45.

4.2.3.1 Sample Locations and Rationale

The surface water sampling rationale are listed in Table 4-1. The surface water samples will be collected from the proposed locations on Figure 4-1. The surface water sample designations and required QA/QC sample requirements are listed in Table 4-3. The exact sampling locations will be determined in the field by the ecological sampler, based on drainage pathways and actual field observations.

Table 4-3

Surface Water and Sediment Sample Designations and QA/QC Sample Quantities
Area M2, Subsection of Area 45
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Designation	Sample Matrix	Sample Depth (ft)	QA/QC Samples			Analytical Suite
				Field Duplicates	Field Splits	MS/MSD	
HR-232Q-SW/SD01	HR-232Q-SW/SD01-SW-EC2001-REG	Surface Water	N/A	HR-232Q-SW/SD01-SW-EC2002-FD	HR-232Q-SW/SD01-SW-EC2003-FS		TCL VOCs, TCL SVOCs, TAL Metals, Nitroexplosives, Perchlorate
HR-232Q-SW/SD01	HR-232Q-SW/SD01-SD-EC1001-REG	Sediment	0-0.5	HR-232Q-SW/SD01-SD-EC1002-FD			(TOC, Grain Size for sediment only)
HR-232Q-SW/SD02	HR-232Q-SW/SD02-SW-EC2004-REG	Surface Water	N/A			HR-232Q-SW/SD02-SW-EC2004-MS/MSD	TCL VOCs, TCL SVOCs, TAL Metals, Nitroexplosives, Perchlorate
HR-232Q-SW/SD02	HR-232Q-SW/SD02-SD-EC1003-REG	Sediment	0-0.5				(TOC, Grain Size for sediment only)
HR-232Q-SW/SD03	HR-232Q-SW/SD03-SW-EC2005-REG	Surface Water	N/A				TCL VOCs, TCL SVOCs, TAL Metals, Nitroexplosives, Perchlorate
HR-232Q-SW/SD03	HR-232Q-SW/SD03-SD-EC1004-REG	Sediment	0-0.5				(TOC, Grain Size for sediment only)
HR-232Q-SW/SD04	HR-232Q-SW/SD04-SW-EC2006-REG	Surface Water	N/A				TCL VOCs, TCL SVOCs, TAL Metals, Nitroexplosives, Perchlorate
HR-232Q-SW/SD04	HR-232Q-SW/SD04-SD-EC1005-REG	Sediment	0-0.5				(TOC, Grain Size for sediment only)
HR-232Q-SW/SD05	HR-232Q-SW/SD05-SW-EC2007-REG	Surface Water	N/A				TCL VOCs, TCL SVOCs, TAL Metals, Nitroexplosives, Perchlorate
HR-232Q-SW/SD05	HR-232Q-SW/SD05-SD-EC1006-REG	Sediment	0-0.5				(TOC, Grain Size for sediment only)

MS/MSD - Matrix spike/matrix spike duplicate.
NA - Not applicable.
QA/QC - Quality assurance/quality control.
REG - Field sample.
SVOC - Semivolatile organic compound.
TAL - Target analyte list.
TCL - Target compound list.
TOC - Total organic carbon.
VOC - Volatile organic compound.

4.2.3.2 Sample Collection

The surface water samples will be collected in accordance with the procedures specified in Section 4.9.1.3 of the SAP (IT, 1998a). Sample documentation and chain of custody will be recorded as specified in Section 4.13 of the SAP. Sample containers, sample volumes, preservatives, and holding times for the analyses required in this SFSP are listed in Section 5.0, Table 5-1, of the QAP. The samples will be analyzed for the parameters listed in Section 4.5 of this SFSP.

4.2.4 Sediment Sampling

Five sediment samples will be collected from Area M2, Subsection of Area 45. These sediment samples will be collected at the same locations as the surface water samples described in Section 4.2.3.

4.2.4.1 Sample Locations and Rationale

The proposed locations for the sediment samples are shown in Figure 4-1. Sediment sampling rationale is presented in Table 4-1. The sediment sample designation and required QA/QC sample requirements are listed in Table 4-3. The actual sediment sample points will be at the discretion of the ecological sampler, based on the drainage pathways and actual field observations.

4.2.4.2 Sample Collection

The sediment samples will be collected in accordance with the procedures specified in Section 4.9.1.2 of the SAP. Sample documentation and chain of custody will be recorded as specified in Section 4.13 of the SAP. The sediment samples will be analyzed for the parameters listed in Section 4.5 of this SFSP.

4.3 Decontamination Requirements

Decontamination will be performed on sampling and nonsampling equipment to prevent cross-contamination between sampling locations. Decontamination of sampling equipment will be performed in accordance with the requirements presented in Section 4.10.1.1 of the SAP (IT, 1998a). Decontamination of nonsampling equipment will be performed in accordance with the requirements presented in Section 4.10.1.2 of the SAP.

4.4 Surveying of Sample Locations

Sampling locations will be marked with pin flags, stakes, and/or flagging and will be surveyed using either global positioning system (GPS) or conventional civil survey techniques, as

necessary to obtain the required level of accuracy. Horizontal coordinates will be referenced to the U.S. State Plane Coordinate System, Alabama East Zone, North American Datum, 1983. Elevations will be referenced to the National Geodetic Vertical Datum of 1929 or the North American Vertical Datum of 1988 (soon to be established on site).

Horizontal coordinates for soil, sediment, and surface water locations will be recorded using a GPS to provide accuracy within 1 meter. Procedures to be used for GPS surveying are described in Section 4.3 of the SAP. Conventional land survey requirements are presented in Section 4.19 of the SAP. All areas at this site must be cleared for UXO avoidance before any surveying activities will commence.

4.5 Analytical Program

Samples collected at locations specified in this chapter of this SFSP will be analyzed for the specific suites of chemicals and elements based on the history of site usage, as well as EPA, ADEM, FTMC, and USACE requirements. Target analyses for samples collected from Area M2, Subsection of Area 45, consist of the following list of analytical suites:

- Target Compound List Volatile Organic Compounds - Method 5035/8260B
- Target Compound List Semivolatile Organic Compounds - Method 8270C
- Target Analyte List Metals - Method 6010B/7000
- Nitroexplosives - Method 8330
- Perchlorate - Method 314.

In addition, the sediment samples will be analyzed for the following list of parameters:

- Total Organic Carbon - Method 9060
- Grain Size - American Society for Testing and Materials D-421/D-422.

The samples will be analyzed using EPA SW-846 methods, including Update III Methods where applicable, as presented in Table 4-4 in this SFSP and Table 6-1 in the QAP. The samples will be submitted to the laboratory for one-week turnaround time. Data will be reported and evaluated in accordance with CESAS Level B criteria (USACE, 1994) and the stipulated requirements for the generation of definitive data (Section 3.1.2 of the QAP). Chemical data will be reported via hard copy data packages by the laboratory using CLP-like forms. These packages will be validated in accordance with EPA National Functional Guidelines by Level III criteria. Data validation turnaround time will be one week after receipt of complete data packages from the laboratory.

Table 4-4

Analytical Samples
Site Investigation
Area M2, Subsection of Area 45
Fort McClellan, Calhoun County, Alabama

Parameters	Analysis Method	Sample Matrix	TAT Needed	Field Samples: No. of Sample Points	Field Samples: No. of Events	Field Samples: No. of Field Samples	QA/QC Samples[a]: Field Dups (10%)	QA/QC Samples[a]: Splits w/ QA Lab (5%)	QA/QC Samples[a]: MS/MSD (5%)	QA/QC Samples[a]: Trip Blank (1/ship)	QA/QC Samples[a]: Eq. Rinse (1/wk/matrix)	Quanterra Total No. Analysis	QA Lab Total No. Analysis
Area M2: 5 water matrix samples (5 surface water samples); **33 soil matrix samples** (14 surface soil samples, 14 subsurface soil samples, and 5 sediment samples													
TCL VOCs	8260B	water	normal	5	1	5	1	1	1	1	1	10	1
TCL SVOCs	8270C	water	normal	5	1	5	1	1	1		1	9	1
Tot TAL Metals	6010B/7000	water	normal	5	1	5	1	1	1		1	9	1
Nitroexplosives	8330	water	normal	5	1	5	1	1	1		1	9	1
Perchlorate	314	water	normal	5	1	5	1	1	1		1	9	1
TCL VOCs	8260B	soil	normal	33	1	33	3	2	2		1	41	2
TCL SVOCs	8270C	soil	normal	33	1	33	3	2	2		1	41	2
TAL Metals	6010B/7000	soil	normal	33	1	33	3	2	2		1	41	2
Nitroexplosives	8330	soil	normal	33	1	33	3	2	2		1	41	2
Perchlorate	314	soil	normal	33	1	33	3	2	2		1	41	2
TOC	9060	sediment	normal	5	1	5						5	0
Grain Size	ASTM D-421/D-422	sediment	normal	5	1	5						5	0
			Area M2 Subtotal:	200			20	15	15	1	10	261	15

[a]Field duplicate, QA split, and MS/MSD samples were calculated as a percentage of the field samples collected per site and were rounded to the nearest whole nur
Trip blank samples will be collected in association with water matrix samples for VOC analysis only. Assume four field samples per day to estimate trip blanks. Equipment bl
will be collected once per event whenever sampling equipment is field decontaminated and re-used. They will be repeated weekly for sampling events that are anticipated
more than 1 week. Assume 20 field samples will be collected per week to estimate number of equipment blar

Ship samples to: Quanterra Environmental Service
5815 Middlebrook Pike
Knoxville, Tennessee 3792:
Attn: John Reynolds
Tel: 865-588-6401
Fax: 865-584-4315

USACE Laboratory spli samples are shipped to: U.S. Army Engineer District, Savannal
Environmental & Materials Distric
Attn: Sample Receiving
200 North Cobb Parkway
Building 400, Suite 40
Marietta, Georgia 3006
Tel: 678-354-0310

MS/MSD - Matrix spike/matrix spike duplicate
QA/QC - Quality assurance/quality contro
SVOC - Semivolatile organic compounc
VOC - Volatile organic compound

TAL - Target analyte list
TCL - Target compound list
TOC - Total organic carbon
ASTM- American Society for Testing and Material

4.6 Sample Preservation, Packaging, and Shipping

Sample preservation, packaging, and shipping will follow the procedures specified in Section 4.13.2 of the SAP (IT, 1998a). Completed analysis request/chain of custody records will be secured and included with each shipment of coolers to:

Attn: John Reynolds
Quanterra Environmental Services
5815 Middlebrook Pike
Knoxville, Tennessee 37921
Telephone: (865) 588-6401.

QA split samples collected for the USACE laboratory will be shipped to the following address:

U.S. Army Engineer District, Savannah
Environmental & Materials Unit
Attn: Sample Receiving
200 North Cobb Parkway
Building 400, Suite 404
Marietta, Georgia 30062
Telephone: (678) 354-0310.

4.7 Investigation-Derived Waste Management

Management and disposal of the investigation-derived wastes (IDW) will follow procedures and requirements as described in Appendix D of the SAP (IT, 1998a). The IDW generated at Area M2, Subsection of Area 45, site is expected to include decontamination fluids and disposable personal protective equipment. The IDW will be staged in the fenced area surrounding Buildings 335 and 336 while awaiting final disposal.

4.8 Site-Specific Safety and Health

Health and safety requirements for this SI are provided in the SSHP attachment for Area M2, Subsection of Area 45. The SSHP attachment will be used in conjunction with the installation-wide SHP.

5.0 Project Organization and Schedule

The project schedule for the SI activities will be provided by the IT project manager to the Base Realignment and Closure Cleanup Team and will be in accordance with the WP.

6.0 References

Environmental Science and Engineering, Inc. (ESE), 1998, ***Final Environmental Baseline Survey, Fort McClellan, Alabama***, prepared for U.S. Army Environmental Center, Aberdeen Proving Ground, Maryland, January.

Fort McClellan (FTMC), 1997***, Fort McClellan Comprehensive Reuse Plan,*** Fort McClellan Reuse and Redevelopment Authority of Alabama, prepared under contract to the Calhoun County Commission, November.

IT Corporation (IT), 1998a, ***Final Installation-Wide Sampling and Analysis Plan, Fort McClellan, Calhoun County, Alabama***, August.

IT Corporation (IT), 1998b, ***Final Installation-Wide Work Plan, Fort McClellan, Calhoun County, Alabama***, August.

U.S. Army Corps of Engineers (USACE), 1999, ***Archives Search Report, Maps, Fort McClellan, Anniston, Alabama,*** July.

U.S. Army Corps of Engineers (USACE), 1994, ***Requirements for the Preparation of Sampling and Analysis Plan***, Engineer Manual EM 200-1-3, September 1.

U.S. Department of Agriculture (USDA), 1961, ***Soil Survey, Calhoun County, Alabama***, Soil Conservation Service, Series 1958, No. 9, September 1961.

U.S. Environmental Protection Agency (EPA), 1993, ***Data Quality Objectives Process for Superfund, Interim Final Guidance***, EPA 540-R-93-071, September.

Final
Site Investigation at Area M2, Subsection of Area 45

Site-Specific Safety and Health Plan Attachment

Fort McClellan
Calhoun County, Alabama
EPA ID No. AL7 210 020 562

Prepared for:

U.S. Army Corps of Engineers, Mobile District
109 St. Joseph Street
Mobile, Alabama 36602

Prepared by:

IT Corporation
312 Directors Drive
Knoxville, Tennessee 37923

Delivery Order CK04
Contract No. DACA21-96-D-0018
IT Project No. 773191

March 2000

Revision 1

This Site-Specific Safety and Health Plan must be used in conjunction with the Installation-Wide Safety and Health Plan, Fort McClellan, Alabama.

The following Site-Specific Safety and Health Plan (SSHP) has been designed for the methods presently contemplated by IT Corporation (IT) for execution of the proposed work. Therefore, the SSHP may not be appropriate if the work is not performed by or using the methods presently contemplated by IT. In addition, as the work is performed, conditions different from those anticipated may be encountered and the SSHP may have to be modified. Therefore, IT only makes representations or warranties as to the adequacy of the SSHP for currently anticipated activities and conditions.

Site-Specific Safety and Health Plan Attachment Approval
Fort McClellan, Calhoun County, Alabama

I have read and approve this site-specific safety and health plan attachment for the site investigation at Area M2, Subsection of Area 45 at Fort McClellan, Alabama, with respect to project hazards, regulatory requirements, and IT Corporation procedures.

Jeanne Yacoub, PE
Project Manager

3/24/00
Date

Michael Henderson, CIH
Health & Safety Manager

3/24/2000
Date

Jeff Tarr
Site Coordinator

3/24/00
Date

Acknowledgements

The draft version of this site-specific safety and health plan (SSHP) attachment for the site investigation at Area M2, Subsection of Area 45 at Fort McClellan, Alabama, has been provided to the site coordinator. I acknowledge my responsibility to provide the site coordinator with the equipment, materials, and qualified personnel to implement fully all safety requirements in this SSHP attachment. I will formally review this plan with the health and safety staff every 6 months until project completion.

Project Manager

3/24/00
Date

I acknowledge receipt of this SSHP attachment from the project manager, and that it is my responsibility to explain its contents to all site personnel and cause these requirements to be fully implemented. Any change in conditions, scope of work, or other change that might affect worker safety requires me to notify the project manager and/or the health and safety manager.

Site Coordinator

3/24/00
Date

Site-Specific Safety and Health Plan
Acknowledgement Form

I have been informed of, and will abide by the procedures set forth in, this site-specific safety and health plan attachment for the activities for the site investigation at Area M2, Subsection of Area 45 at Fort McClellan, Calhoun County, Alabama.

Printed Name	***Signature***	***Representing***	***Date***

Fort McClellan Gate Hours

Baltzell Gate	Baltzell Road. Open 24 hours daily, 7 days a week.

Fort McClellan Project Emergency Contacts

Fire Department (on post)	911
Fire Department (off post)	(256) 257-3541
Ambulance (off post)	911
Regional Medical Center	(256) 235-5121
Military Police (SSG Busch)	(256) 848-5680, 848-4824
DOD Guard Force (Mr. Bolton)	(256) 848-5680, 848-4732
Anniston Police Department	(256) 238-1800
Chemical Agent Emergencies	(256) 820-7272
(Hank Hubbard, Huntsville COE UXO EODT)	cell phone (205) 994-2254 or 994-2269
UXO Emergencies	(256) 820-7272
(Hank Hubbard, Huntsville COE UXO EODT)	cell phone (205) 994-2254 or 994-2269
UXO Nonemergencies/Reporting Only (Ronald Levy)	(256) 848-3758
Baltzell Gate Guard Shack (Staffed 1600-0700 hours, Mon-Sun)	(256) 848-5693, 848-3821
National Response Center & Terrorist Hotline	(800) 424-8802
Poison Control Center	(800) 462-0800
EPA Region IV	(404) 562-8725
Ronald Levy, Chief, FTMC Environmental Management	(256) 848-3758
Ellis Pope, U.S. Army Corps of Engineers	(334) 690-3077
Jeanne Yacoub, IT Project Manager	(770) 663-1429
Michael Henderson, IT H&S Manager	(865) 690-3211
Mike Moore, Fort McClellan Safety Office	(256) 848-5433
Dr. Elaine Theriault, IT Occupational Physician	(800) 229-3674

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List of Acronyms

BZ	breathing zone
FTMC	Fort McClellan
PPE	personal protective equipment
SHP	installation-wide safety and health plan
SSHO	site safety and health officer
SSHP	site-specific safety and health plan
UXO	unexploded ordnance

1.0 Site Work Plan Summary

Project Objective. The objective of this investigation at Fort McClellan (FTMC), Calhoun County, Alabama is to collect and analyze samples at Area M2, Subsection of Area 45.

Project Tasks

X Provide unexploded ordnance (UXO) surface avoidance and downhole survey support during field work at all locations

X Collect three sediment samples

X Collect three surface water samples

X Collect ten surface soil samples.

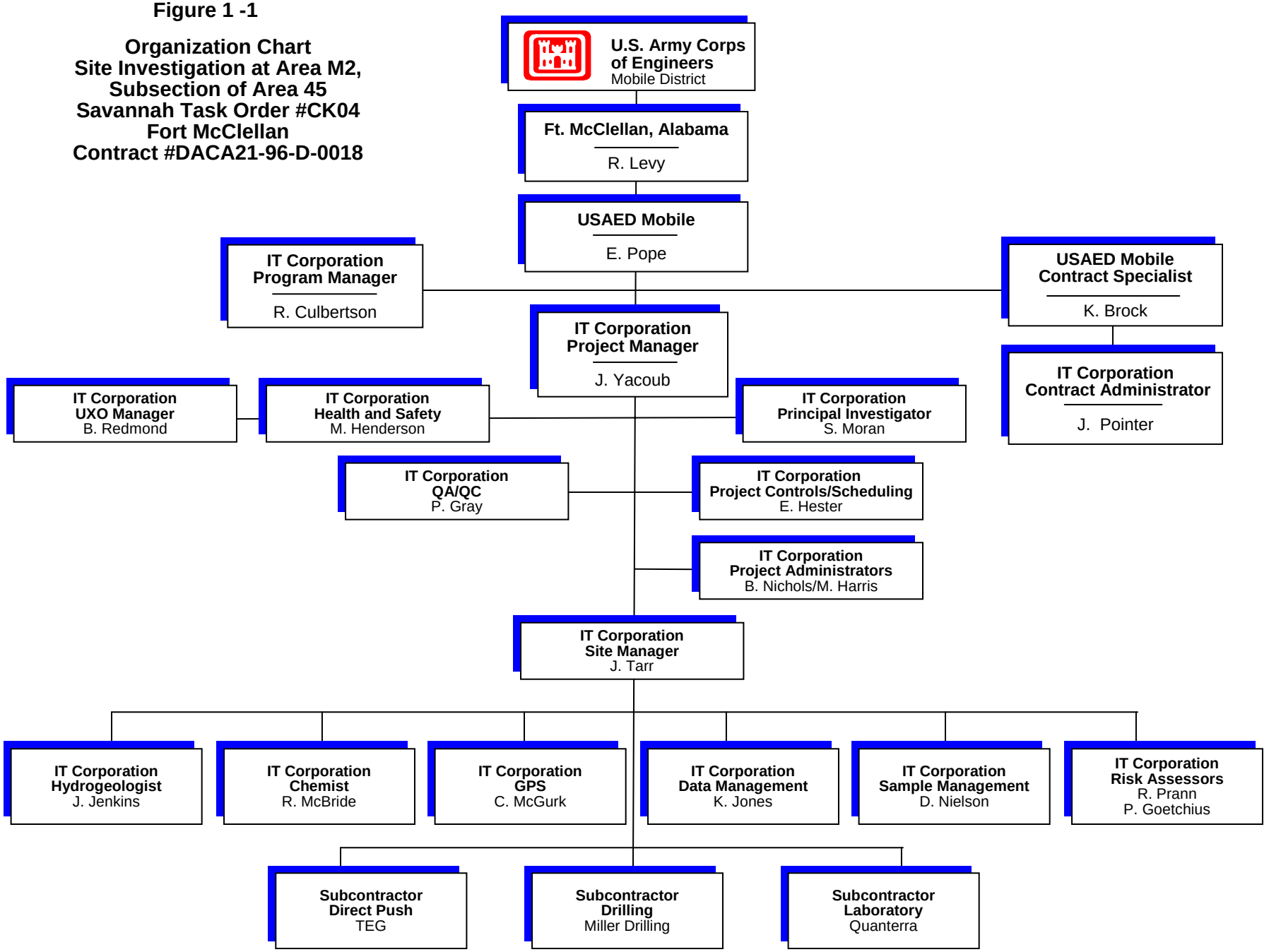
X Collect ten subsurface soil samples.

Personnel Requirements. Up to 15 employees. An organizational chart is included as Figure 1-1.

Note: All personnel on this site shall have received training, informational programs, and medical surveillance as outlined in the installation-wide safety and health plan (SHP) for site investigations at FTMC, and be familiar with the requirements of this site-specific SHP (SSHP). This SSHP must be used in conjunction with the SHP, Fort McClellan, Alabama.

Figure 1 -1

Organization Chart
Site Investigation at Area M2,
Subsection of Area 45
Savannah Task Order #CK04
Fort McClellan
Contract #DACA21-96-D-0018



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2.0 Site Characterization and Analysis

2.1 Anticipated Hazards

The activity hazard analysis in Chapter 5.0 contains project-specific practices utilized to reduce or eliminate anticipated site hazards. The activity hazard analysis indicates specific chemical and physical hazards that may be present and encountered during each task from on-site operations. Below each task is a list of hazards and specific actions that will be taken to control the respective hazards. These control measures may include work practice controls, engineering controls, and/or use of appropriate personal protective equipment (PPE).

Section 1.2 of the site-specific field sampling plan addresses the area's location and history.

Table 2-1 contains the toxicological and physiological properties of chemicals anticipated or to be used at Area M2.

Area M2, Subsection of Area 45, is an area where no known or recorded storage, release, or disposal (including migration) has occurred on site property. The presence of UXO is suspected at this area.

2.2 General Site Information

Duration of Planned Employee Activity. Employee activity duration is 1 month.

Pathways for Hazardous Substance Dispersion. Possible pathways for hazardous substances in the area are water and soils.

Table 2-1

Toxicological and Physical Properties of Chemicals
Site Investigation at Area M2, Subsection of Area 45
Fort McClellan, Calhoun County, Alabama

Substance [CAS]	IP[a] (eV)	Odor Threshold (ppm)	Route[b]	Symptoms of Exposure	Treatment	TWA[c]	STEL[d]	Source[e]	IDLH (NIOSH)[f]
Acetone [67-64-1]	9.7	13B100	Inh Ing Con	Irritated eyes, nose, and throat; headache, dizziness; dermatitis.	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention	750 ppm 750 ppm 250 ppm	1,000 ppm 1,000 ppm	PEL TLV REL	20,000 ppm
Fuel oil (diesel oil, medium)	?	?	Ing Inh Con	Ingestion causes nausea, vomiting, and cramps; depressed central nervous system, headache, coma, death; pulmonary irritation; kidney and liver damage; aspiration causes severe lung irritation, coughing, gagging, dyspnea, substernal stress, pulmonary edema; broncho-pneumonia; excited, then depressed, central nervous system.	Eye: Irrigate promptly Skin: Soap wash Breath: Respiratory support Swallow: Immediate medical attention Aspiration: Immediate medical attention			PEL TLV REL	
Gasoline [8006-61-9]	?	0.3	Inh Ing Con	Intoxication, headaches, blurred vision, dizziness, nausea; eye, nose throat irritation; potential kidney and other cancers. Carcinogenic.	Eye: Irrigate immediately (15 min) Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	300 ppm 300 ppm Ca, lowest feasible conc. (LOQ 15 ppm)	500 ppm 500 ppm	PEL TLV REL	?
n-Hexane [110-54-3]	10.18	65B248	Inh Ing Con	Lightheadedness; nausea, headache; numbness of the extremities, muscular weakness; irritation of the eyes and nose; dermatitis; chemical pneumonia; giddiness.	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention	50 ppm 50 ppm 50 ppm		PEL TLV REL	5,000 ppm
Isopropyl alcohol (isopropanol) [67-63-0]	10.16	43B200	Inh Ing Con	Mild irritation of the eyes, nose, and throat; drowsiness, dizziness, head-ache; dry, cracked skin.	Eye: Irrigate immediately Skin: Water flush Breath: Respiratory support Swallow: Immediate medical attention	400 ppm 400 ppm 400 ppm	500 ppm 500 ppm 500 ppm	PEL TLV REL	12,000 ppm
Motor Oil [NA]	?	?	Inh Ing	Irritated eyes, skin, respiratory system; usually only a problem if misted or ingested.	Eye: Irrigate immediately (15 min) Skin: Soap wash immediately Swallow: Immediate medical attention		500 ppm 500 ppm 500 ppm	PEL TLV REL	

Table 2-1

Toxicological and Physical Properties of Chemicals
Site Investigation at Area M2, Subsection of Area 45
Fort McClellan, Calhoun County, Alabama

Substance [CAS]	IP[a] (eV)	Odor Threshold (ppm)	Route[b]	Symptoms of Exposure	Treatment	TWA[c]	STEL[d]	Source[e]	IDLH (NIOSH)[f]
Nitric acid [7697-37-2]	11.95	0.3B1	Inh Ing Con	Irritated eyes, mucous membranes, and skin; delayed pulmonary edema, pneumonitis, bronchitis; dental erosion.	Eye: Irrigate immediately Skin: Water flush promptly Breath: Respiratory support Swallow: Immediate medical attention	2 ppm 2 ppm 2 ppm	4 ppm 4 ppm 4 ppm	PEL TLV REL	100 ppm
Portland cement			Inh	Fine gray powder that can be irritating if inhaled or in eyes.	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention		10 mg/m^3 10 mg/m^3/ total dust 5 mg/m^3 respirable fraction	TLV PEL/REL	
Sodium hydroxide [1310-73-2]	NA	NA	Inh Ing Con	Irritated nose; pneumonitis; burns eyes, and skin; temporary loss of hair.	Eye: Irrigate immediately Skin: Water flush immediately Breath: Respiratory support Swallow: Immediate medical attention		C2 mg/m^3 C2 mg/m^3 C2 mg/m^3	PEL TLV REL	250 mg/m^3
Sulfuric acid [7664-93-9]	?	0.15	Inh Ing Con	Irritated eyes, nose, and throat; pulmonary edema, bronchitis; emphysema; conjunctivitis; stomatitis; dental erosion; tracheobronchitis; skin and eye burns; dermatitis.	Eye: Irrigate immediately Skin: Water flush immediately Breath: Respiratory support Swallow: Immediate medical attention	1 mg/m^3 1 mg/m^3 1 mg/m^3	3 mg/m^3	PEL TLV REL	80 mg/m^3

[a]IP = Ionization potential (electron volts).
[b]Route = Inh, Inhalation; Abs, Skin absorption; Ing, Ingestion; Con, Skin and/or eye contact.
[c]TWA = Time-weighted average. The TWA concentration for a normal work day (usually 8 or 10 hours) and a 40-hour work week, to which nearly all workers may be repeatedly exposed, day after day without adverse effect.
[d]STEL = Short-term exposure limit. A 15-minute TWA exposure that should not be exceeded at any time during a workday, even if the TWA is not exceeded.
[e]PEL = Occupational Safety and Health Administration (OSHA) permissible exposure limit (29 CFR 1910.1000, Table Z).
AEL = Airborne Exposure Limit.
TLV = American Conference of Governmental Industrial Hygiene (ACGIH) threshold limit valueXTWA.
REL = National Institute for Occupational Safety and Health (NIOSH) recommended exposure limit.
[f]IDLH (NIOSH)XImmediately dangerous to life or health (NIOSH). Represents the maximum concentration from which, in the event of respirator failure, one could escape within 30 minutes without a respirator and without experiencing any escape-impairing or irreversible health effects.
NE = No evidence could be found for the existence of an IDLH (NIOSH Pocket Guide to Chemical Hazards, Pub. 1998).
C = Ceiling limit value which should not be exceeded at any time.
Ca = Carcinogen.
NA = Not applicable.
? = Unknown.
LEL = Lower explosive limits.

Table 2-1

Toxicological and Physical Properties of Chemicals
Site Investigation at Area M2, Subsection of Area 45
Fort McClellan, Calhoun County, Alabama

LC_{50} = Lethal concentration for 50 percent of population tested.
LD_{50} = Lethal dose for 50 percent of population tested.
NIC = Notice of intended change (ACGIH).

References:

American Conference of Governmental Industrial Hygienists Guide to Occupational Exposure Values, 1998, compiled by the American Conference of Governmental Industrial Hygienists.
Amoore, J. E. Hautula, "Odor as an Aid to Chemical Safety," Journal of Applied Toxicology, 1983.
Clayton, George D., Clayton, F. E., Patty's Industrial Hygiene and Toxicology, 3rd ed., John Wiley & Sons, New York.
Documentation of TLVs and BEIs, American Conference of Governmental Industrial Hygienists, 6th ed., 1998.
Fazzuluri, F. A., Compilation of Odor and Taste Threshold Values Data, American Society for Testing and Materials, 1978.
Gemet, L. J. Van, Compilation of Odor Threshold Values in Air and Water, CIVO, Netherlands, 1977.
Gemet, L. J. Van, Compilation of Odor Threshold Values in Air and Water, Supplement IV, CIVO, Netherlands, 1977.
Lewis, Richard J., Sr., 1992, Sax's Dangerous Properties of Industrial Materials, 8th ed., Van Nostrand Reinhold, New York.
Micromedex Tomes Plus (R) System, 1992, Micromedex, Inc.
National Institute for Occupational Safety and Health Pocket Guide to Chemicals, Pub. 1998, National Institute for Occupational Safety and Health.
Odor Threshold for Chemicals with Established Occupational Health Standards, American Industrial Hygiene Association, 1989.
Respirator Selection Guide, 3M Occupational Health and Safety Division, 1993.
Verschuseren, K., Handbook of Environmental Data on Organic Chemicals, Van Nostrand and Reinhold, 1977.
Warning Properties of Industrial ChemicalsXOccupational Health Resource Center, Oregon Lung Association.
Workplace Environmental Exposure Levels, American Industrial Hygiene Association, 1992.

3.0 Personal Protective Equipment

The work activities will begin in the following levels of protection. Also, a completed description of Level D, Modified Level D, and Level C PPE is provided.

Task	Initial Level of PPE
Staging equipment	Level D
Collecting samples	Modified Level D*
Install monitoring wells	Modified Level D*

*Initial level will be raised to Level C or higher if air monitoring results for volatile organic hydrocarbons in the worker=s breathing zone (BZ) are greater than action levels.

Level D. The minimal level of protection that will be required of IT personnel at the site will be Level D. The following equipment will be used for Level D protection:

X Coveralls or work clothing
X Leather work gloves (when necessary)
X Steel-toed safety boots
X Safety glasses
X Hard hat
X Hearing protection (when working near/adjacent to operating equipment).

Note: UXO personnel should not wear hard hats and steel-toed shoes when engaged in ordnance operations unless a significant overhead hazard exists. Where overhead hazards exist, a chin strap will be worn with hard hats to prevent accidental falling of hard hat.

Modified Level D. The following equipment will be used for Level D-Modified protection:

X Permeable Tyvek, Kleenguard, or its equivalent (Saran-coated tyvek where chemical agents are anticipated)

X Latex boot covers

X Nitrile, heavy work, or latex gloves

X Steel-toed safety boots

X Safety glasses

X Hard hat

X Hearing protection (when working near/adjacent to operating equipment).

Note: In addition to modifying Level D PPE, the operator of high-pressure water jetting equipment shall wear metatarsal guards for the legs and feet.

Note: UXO personnel should not wear hard hats and steel-toed shoes when engaged in ordnance operations unless a significant overhead hazard exists. Where overhead hazards exist, a chin strap will be worn with hard hats to prevent accidental falling of hard hat.

Level C. Level C protection will not be used unless air-monitoring data indicate the need for upgrade; however, the equipment shall be readily available on site. The following equipment will be used for Level C protection:

X National Institute of Occupational Safety and Health-approved full-face, air-purifying respirators equipped with organic vapor/acid gas/P100 cartridge

X Tyvek (or equivalent), taped at gloves, boots, and respirator

X Nitrile gloves (outer)

X Latex or lightweight nitrile gloves (inner)

X Neoprene steel-toed boots or polyvinyl chloride overbooties/steel-toed safety boots

X Hard hat

X Hearing protection (when working near/adjacent to operating equipment)

Note: In addition to Level C PPE, the operator of high-pressure water jetting equipment shall wear metatarsal guards for the legs and feet.

4.0 Site Monitoring

There are no known environmental contaminants of concern at Area M2, Subsection of Area 45. Table 4-1 contains action levels for site monitoring at the sites.

Chemical. Monitoring will be performed by the site safety and health officer (SSHO) during the performance of ground intrusive operations. A calibrated flame ionization detector (i.e., OVA 128 or equivalent) organic vapor analyzer will be utilized to monitor the sampling locations and BZs to determine if any organic material may be present that would necessitate upgrading of protection level. A calibrated combustible gas/oxygen indicator will be utilized to monitor the work areas and BZs to determine if any combustible/flammable oxygen levels may be present that would necessitate evacuation of the work area. Table 4-2 contains the air monitoring frequency and location for site monitoring at the work sites.

Unexploded Ordnance. UXO safety will be achieved by employing UXO specialists to ensure that field personnel do not come into contact with UXO. In areas where UXO is suspected to exist, the UXO specialists will perform the following UXO avoidance operations.

X ***Area UXO Surveys Using Magnetometers.*** During this operation UXO on the surface will be detected and marked for avoidance during field operations. Metal objects just below the surface (within 2 feet) will also be marked to indicate the potential hazard.

X ***Downhole UXO Surveys.*** UXO specialists will perform downhole magnetometer surveys to detect metal objects in the path of the boring apparatus until undisturbed soils are reached. The boring location will be moved if subsurface metal objects are detected.

Table 4-1

Action Levels
Site Investigation at Area M2, Subsection of Area 45
Fort McClellan, Calhoun County, Alabama

When in Level C PPE

Analyte	Action Level	Required Action[a]
VOHs	≥ 10 ppm above background in breathing zone (BZ)	Stop work, evacuate work area, upgrade to Level B.
Oxygen	≥ 20%, <23% < 20%, >23%	Normal operations. Stop work, evacuate work area.
Flammable vapors	≥ 10% LEL < 10% LEL	Stop work, evacuate work area. Continue operations, monitor for VOCs.

When in Level D Modified/D PPE

Analyte	Action Level	Required Action[b]
VOHs	≥ 5 ppm above background in BZ	Stop activities, suspend work activities for 15 to 30 minutes, if readings are sustained then upgrade to Level C PPE.
Oxygen	≥ 20%, <23% < 20%, >23%	Normal operations. Stop work, evacuate work area.
Flammable vapors	≥ 10% LEL < 10% LEL	Stop work, evacuate work area. Continue operations, monitor for VOCs.

Table 4-1

Action Levels
Site Investigation at Area M2, Subsection of Area 45
Fort McClellan, Calhoun County, Alabama

When in Support Zone

Analyte	Action Level	Required Action
VOHs	≥ 1 ppm above background in BZ	Evacuate support zone and re-establish perimeter of exclusion zone.

[a] Four instantaneous peaks in any 15-minute period or a sustained reading for 5 minutes in excess of the action level will trigger a response.

[b] Contact with the H&S manager must be made prior to continuance of work. The H&S manager may then initiate perimeter/integrated air sampling along with additional engineering controls.

No one is permitted to downgrade levels of PPE without authorization from the H&S manager.

Table 4-2

Air Monitoring Frequency and Location
Site Investigation at Area M2, Subsection of Area 45
Fort McClellan, Calhoun County, Alabama

Work Activity	Instrument	Frequency	Location
Staging equipment	OV Monitor	Initially for area	Breathing zone (BZ) of employees
Land Survey	OV Monitor	Initially for area	BZ of employees
Sampling (water and soil)	OV Monitor LEL/O_2 Monitor	Continuously Continuously	BZ of employees and/or work area
Installing monitoring wells	OV Monitor LEL/O2 Monitor	Continuously Continuously	BZ of employees and/or work area

OV = Organic vapor.
LEL/O_2 = Lower explosive level/oxygen.

5.0 Activity Hazard Analysis

The attached activity hazard analysis (Table 5-1) is provided for the following activities:

- X Setup of equipment and general field activities
- X Land survey
- X Soil and water sampling
- X Installation of monitoring wells.

All injuries and illnesses must be immediately reported to the site manager or the SSHO, who will then notify off-site personnel and organizations as necessary.

If hospital care must be provided, the victim shall be treated at Northeast Regional Medical Center. Directions to the hospital are provided in Figure 1-2.

Table 5-1

Activity Hazard Analysis
Site Investigation at Area M2, Subsection of Area 45
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Staging equipment	Unexploded ordnance (UXO)	X UXO specialists will perform UXO surface clearance and/or UXO downhole clearance for UXO avoidance. See site-specific safety and health plans (SSHP) to determine if required.
	Slip, trip, and fall hazards	X Determine best access route before transporting equipment. X Practice good housekeeping; keep work area picked up and clean as feasible. X Continually inspect the work area for slip, trip, and fall hazards. X Look before you step; ensure safe and secure footing.
	Heavy lifting	X Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment.
	Falling objects	X Stay alert and clear of materials suspended overhead; wear hard hat and steel-toed boots.
	Flying debris, dirt, dust, etc.	X Wear safety glasses/goggles; ensure that eye wash is in proper working condition.
	Pinch points	X Keep hands, fingers, and feet clear of moving/suspended materials and equipment. X Beware of contact points. X Stay alert at all times!
	Cuts/bruises	X Use cotton or leather work gloves for material handling.
	Bees, spiders, and snakes	X Inspect work area carefully and avoid placing hands and feet into concealed areas.
	Ticks	X Wear light colored clothing (can see ticks better). X Mow vegetated and small brush areas. X Wear insect repellant. X Wear long sleeves and long pants. X Visually check oneself promptly and frequently after exiting the work area.
	Fire	X Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition.

Table 5-1

Activity Hazard Analysis
Site Investigation at Area M2, Subsection of Area 45
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Staging equipment (continued)	Contact with moving equipment/vehicles	X Work area will be barricaded/demarcated. X Equipment will be laid out in an area free of traffic flow.
	Hazard communication	X Label all containers as to contents and dispose of properly. X Ensure Material Safety Data Sheets (MSDS) are available for hazardous chemicals used on site.
	Noise	X Sound levels above 85 decibels (dBA) mandates hearing protection.
	Lighting	X Adequate lighting will be provided to ensure a safe working environment.
	Cold stress	X Workers should wear insulated clothing when temperatures drop below 40 degrees Fahrenheit (F). X Drink warm beverages on breaks. Refrain from drinking caffeinated beverages. X Remove wet clothing promptly. X Take breaks in warm areas. X Reduce work periods as necessary. X Layer work clothing.
	Poison ivy/oak/sumac	X Avoid plant areas if possible. X Wear long sleeves and long pants. X Promptly wash clothing that has contacted poisonous plants. X Wash affected areas immediately with soap and water.
	Heat rash	X Keep the skin clean and dry. X Change perspiration-soaked clothing, as necessary. X Bathe at end of work shift or day. X Apply powder to affected area.
	Heat cramps	X Drink plenty of cool fluids even when not thirsty. X Provide cool fluid for work crews. X Move victim to shaded, cool area.

Table 5-1

Activity Hazard Analysis
Site Investigation at Area M2, Subsection of Area 45
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Staging equipment (continued)	Heat exhaustion	X Conduct physiological worker monitoring as needed (i.e., heart rate, oral temperature) X Set up work/rest periods. X Use the buddy system. X Allow workers time to acclimate. X Have ice packs available for use. X Take frequent breaks.
	Heat stroke	X Evaluate possibility of night work. X Perform physiological monitoring on workers during breaks. X Wear body cooling devices.
	Contact with moving equipment/vehicles	X Work area will be barricaded/demarcated. X Equipment will be laid out in an area free of traffic flow. X Barricades shall be used on or around work areas when it is necessary to prevent the inadvertent intrusion of pedestrian traffic. X Barriers shall be used to protect workers from vehicular traffic. X Barriers shall be used to guard excavations adjacent to streets or roadways. X Flagging shall be used for the short term (less than 24 hours) to identify hazards until proper barricades or barriers are provided. X Heavy equipment shall have backup alarms.
	Forklift operations	X Use qualified and trained forklift operators. X The operator shall not exceed the load capacity rating for the forklift. X The load capacity shall be clearly visible on the forklift. X Forklift operators shall inform their supervisor of any prescribed medication that they are taking that would impair their judgement.
	Portable electric tools	X Portable electric tools that are unsafe due to faulty plugs, damaged cords, or other reasons, shall be tagged (do not use) and removed from service. X Portable electric tools and all cord and plug connected equipment shall be protected by a ground fault circuit interrupter (GFCI) device. X Electrical tools shall be inspected daily prior to use.

Table 5-1

Activity Hazard Analysis
Site Investigation at Area M2, Subsection of Area 45
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Staging equipment (continued)	Extension cords	X Extension cords that have faulty plugs, damaged insulation, or are unsafe in any way shall be removed from service. X Cords shall be protected from damage from sharp edges, projections, pinch points (doorways), and vehicular traffic. X Cords shall be suspended with a nonconductive support (rope, plastic ties, etc,). X Cords shall be designed for hard duty. X Cords shall be inspected daily.
	Lightning strikes	X Whenever possible, halt activities and take cover. X If outdoors, stay low to the ground. X Limit the body surface area that is in contact with the ground (i.e., kneeling on one knee is better than laying on the ground). X Seek shelter in a building if possible. X Stay away from windows. X If available, crouch under a group of trees instead of one single tree. X Keep all body parts in contact with the ground as close as possible. X Remain 6 feet away from tree trunk if seeking shelter beneath tree(s). X If in a group, keep 6 feet of distance between people.
	Thunderstorms, tornados	X Listen to radio or TV announcements for pending weather information. X Cease field activities during thunderstorm or tornado warnings. X Seek shelter. Do not try to outrun a tornado.
Surveying	Slip, trip, fall	X Site workers will be required to wear hard hat, safety glasses with side shields, work gloves, and steel-toe boots when working in the field. X Provide adequate lighting in all work areas. X Whenever possible, avoid routing cords and hoses across walking pathways. X Flag or cover inconspicuous holes to protect against falls. X Work areas will be kept clean and orderly. X Garbage and trash will be disposed of daily in approved refuse containers. X Tools and accessories will be properly maintained and stored. X Work areas and floors will be kept free of dirt, grease, and slippery materials.

Table 5-1

Activity Hazard Analysis
Site Investigation at Area M2, Subsection of Area 45
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Surveying (continued)	Traffic accidents	X Place physical barrier (i.e., barricades, fencing) around work areas regularly occupied by pedestrians. X If working adjacent to roadways, have workers wear fluorescent orange vests. X Use warning signs or lights to alert oncoming traffic. X Assign flag person(s) if necessary to direct local traffic. X Set up temporary parking locations outside the immediate work area. X Motor vehicle operators shall obey all posted traffic signs, signals, and speed limits. X Pedestrians have the right-of-way. X Wear seat belts when vehicles are in motion.
	Wildlife hazards	X Workers should be cautious when driving through the site in order to avoid encounters with passing animals.
	Biological hazards	X Walking through overgrown grass areas, watch for snakes (rattlesnakes, moccasins, copperheads).
	Ticks	X Wear light colored clothing (can see ticks better). X Mow vegetated and small brush areas. X Wear insect repellant. X Wear long sleeves and long pants. X Visually check oneself promptly and frequently after exiting the work area.
	Poison ivy/oak/sumac	X Avoid plant areas if possible. X Wear long sleeves and long pants. X Promptly wash clothing that has contacted poisonous plants. X Wash affected areas immediately with soap and water.
Hydropunch sampling	Faulty or damaged equipment being utilized to perform work	X All machinery or mechanized equipment will be inspected by a competent mechanic and be certified to be in safe operating condition. X Equipment will be inspected before being put to use and at the beginning of each shift. X Faulty/unsafe equipment will be tagged and if possible locked out. X Drill rigs shall be equipped with reverse signal alarm, backup warning lights, or the vehicle is backed up only when an observer signals it is safe to do so.

Table 5-1

Activity Hazard Analysis
Site Investigation at Area M2, Subsection of Area 45
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Hydropunch sampling (continued)	Uneven terrain, poor ground support, inadequate clearances, contact with utilities	X Inspections or determinations of road conditions and structures shall be made in advance to ensure that clearances and load capacities are safe for the passage or placing of any machinery or equipment. X All mobile equipment and areas in which they are operated shall be adequately illuminated. X Whenever the equipment is parked, the parking brake shall be set. X Equipment parked on inclines will have the wheels chocked. X Inspect brakes and tire pressure on drill rig before staging for work. X Obtain trenching/drilling permit prior to operation.
	Inexperienced operator	X Machinery and mechanized equipment shall be operated only by designated personnel. X Heavy equipment operators shall inform their supervisor(s) of any prescribed medication that they are taking that would impair their judgement.
	Jacks/outriggers	X Ensure proper footing and cribbing.
	UXO	X UXO specialists will perform UXO surface clearance and/or UXO downhole clearance for UXO avoidance. See SSHPs to determine if required.
	Falling objects	X Remove unsecured tools and materials before raising or lowering the derrick. X Stay alert and clear of materials suspended overhead.
	Pinch points	X Keep feet and hands clear of moving/suspended materials and equipment. X Stay alert at all times!
	Fire	X Mechanized equipment shall be shut down prior to and during fueling operations. X Have fire extinguishers inspected and readily available.
	Fall hazards	X Personnel are not allowed to work off of machinery or use them as ladders. X Use fall protection when working above 6 feet.
	Noise	X Hearing protection is mandatory above 85 dBA.
	Contact with rotating or reciprocating machine part	X Use machine guards; use long-handled shovels to remove auger cuttings. X Safe lockout procedures for maintenance work.

Table 5-1

Activity Hazard Analysis
Site Investigation at Area M2, Subsection of Area 45
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Hydropunch sampling (continued)	Heavy lifting	X Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment; size-up the lift.
	Slip, trip, and fall hazards	X Practice good housekeeping; keep work area picked up and clean as feasible. X Continually inspect the work area for slip, trip, and fall hazards.
	Contact with potentially contaminated materials	X Real-time air monitoring will take place. If necessary, proper personal protective clothing and equipment will be utilized.
Groundwater sampling	Cross-contamination and contact with potentially contaminated materials	X Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination. X Avoid skin contact with water. X Handle samples with care. X Only essential personnel will be in the work area. X Real-time air monitoring will take place before and during sampling activities. X All personnel will follow good hygiene practices. X Proper decontamination procedures will be followed. X All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations.
	UXO	X UXO specialists will perform UXO surface clearance and/or UXO downhole clearance for UXO avoidance. See SSHPs to determine if required.
	Cut hazards	X Use care when handling glassware. X Wear adequate hand protection.
	Hazard communication	X MSDSs shall be obtained for chemicals brought on site. X Label all containers as to contents.
	Strains/sprains	X Use the proper tool for the job being performed. X Get assistance if needed. X Avoid twisting/turning while pulling on tools, moving equipment, etc.
	Spills/residual materials	X Absorbent material and containers will be kept available where leaks or spills may occur.

Table 5-1

Activity Hazard Analysis
Site Investigation at Area M2, Subsection of Area 45
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Groundwater Sampling (continued)	Lighting	X Adequate lighting will be provided to ensure a safe working environment.
	Unattended worker	X Use "buddy system" - visual contact will be maintained with the sampling technician during sampling activities.
Surface Water/ Sediment Samples	Drowning	X Personnel will wear personal flotation devices when working on, over, or adjacent to the water.
	Contact with potentially contaminated materials	X Wear proper PPE when sampling.
Soil boring and surface/subsurface sampling	Cross-contamination and contact with potentially contaminated materials	X Stop immediately at any sign of obstruction. X Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination. X Only essential personnel will be in the work area. X Real-time air monitoring will take place before and during sampling activities. X All personnel will follow good hygiene practices. X Proper decontamination procedures will be followed. X All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations.
	Cut hazards	X Use care when handling glassware. X Wear adequate hand protection.
	Slip, trip, fall	X Site workers will be required to wear hard hat, safety glasses with side shields, work gloves, and steel-toe/shank boots when working in the field. X Whenever possible, avoid routing cords and hoses across walking pathways. X Flag or cover inconspicuous holes to protect against falls.
	UXO	X UXO specialists will perform UXO surface clearance and/or UXO downhole clearance for UXO avoidance. See SSHPs to determine if required.
	Bees, spiders, and snakes	X Workers shall inspect the work area carefully and avoid placing hands and feet into concealed areas. X Evaluate need for sensitive workers to have prescribed antibiotic or medicine to combat onset of symptoms.

Table 5-1

Activity Hazard Analysis
Site Investigation at Area M2, Subsection of Area 45
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Soil boring and surface/subsurface sampling (continued)	Poison ivy/oak/sumac	X Avoid plant areas if possible. X Wear long sleeves and long pants. X Promptly wash clothing that has contacted poisonous plants. X Wash affected areas immediately with soap and water.
	Cold stress	X Workers should wear insulated clothing when temperatures drop below 40^{o}F. X Drink warm beverages on breaks. Refrain from drinking caffeinated beverages. X Remove wet clothing promptly. X Take breaks in warm areas. X Reduce work periods as necessary. X Layer work clothing.
	Access/egress hazards	X Use qualified and trained bushhog operator. X Keep employees out of the bushhog work area. X Utilize good housekeeping practices. X Keep aisleways, pathways, and work areas free of obstruction. X Clean ice or snow off of walkways or work stations. X Use appropriate footwear for the task assigned.
	Heat rash	X Keep the skin clean and dry. X Change perspiration-soaked clothing, as necessary. X Bathe at end of work shift or day. X Apply powder to affected area.
	Heat cramps	X Drink plenty of cool fluids even when not thirsty. X Provide cool fluid for work crews. X Move victim to shaded, cool area.
	Heat exhaustion	X Conduct physiological worker monitoring as needed (i.e., heart rate, oral temperature) X Set up work/rest periods. X Use the buddy system. X Allow workers time to acclimate. X Have ice packs available for use. X Take frequent breaks.

Table 5-1

Activity Hazard Analysis
Site Investigation at Area M2, Subsection of Area 45
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Soil boring and surface/ subsurface sampling (continued)	Heat stroke	X Evaluate possibility of night work. X Perform physiological monitoring on workers during breaks. X Wear body cooling devices.
	Lightning strikes	X Whenever possible, halt activities and take cover. X If outdoors, stay low to the ground. X Limit the body surface area that is in contact with the ground (i.e., kneeling on one knee is better than laying on the ground). X Seek shelter in a building if possible. X Stay away from windows. X If available, crouch under a group of trees instead of one single tree. X Keep all body parts in contact with the ground as close as possible. X If in a group, keep 6 feet of distance between people.
	Thunderstorms, tornados	X Listen to radio or TV announcements for pending weather information. X Cease field activities during thunderstorms or tornado warnings. X Seek shelter. Do not try to outrun a tornado.
Moving and shipping collected samples	Heavy lifting	X Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment; size-up the lift.
	Pinch points	X Keep hands, fingers, and feet clear of moving/suspended materials and equipment. X Beware of contact points. X Stay alert at all times!
	Cut hazards	X Wear adequate hand protection. Use care when handling glassware.
	Hazard communication	X Label all containers as to contents and associated
	Heavy lifting	X Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment; size-up the lift.

Table 5-1

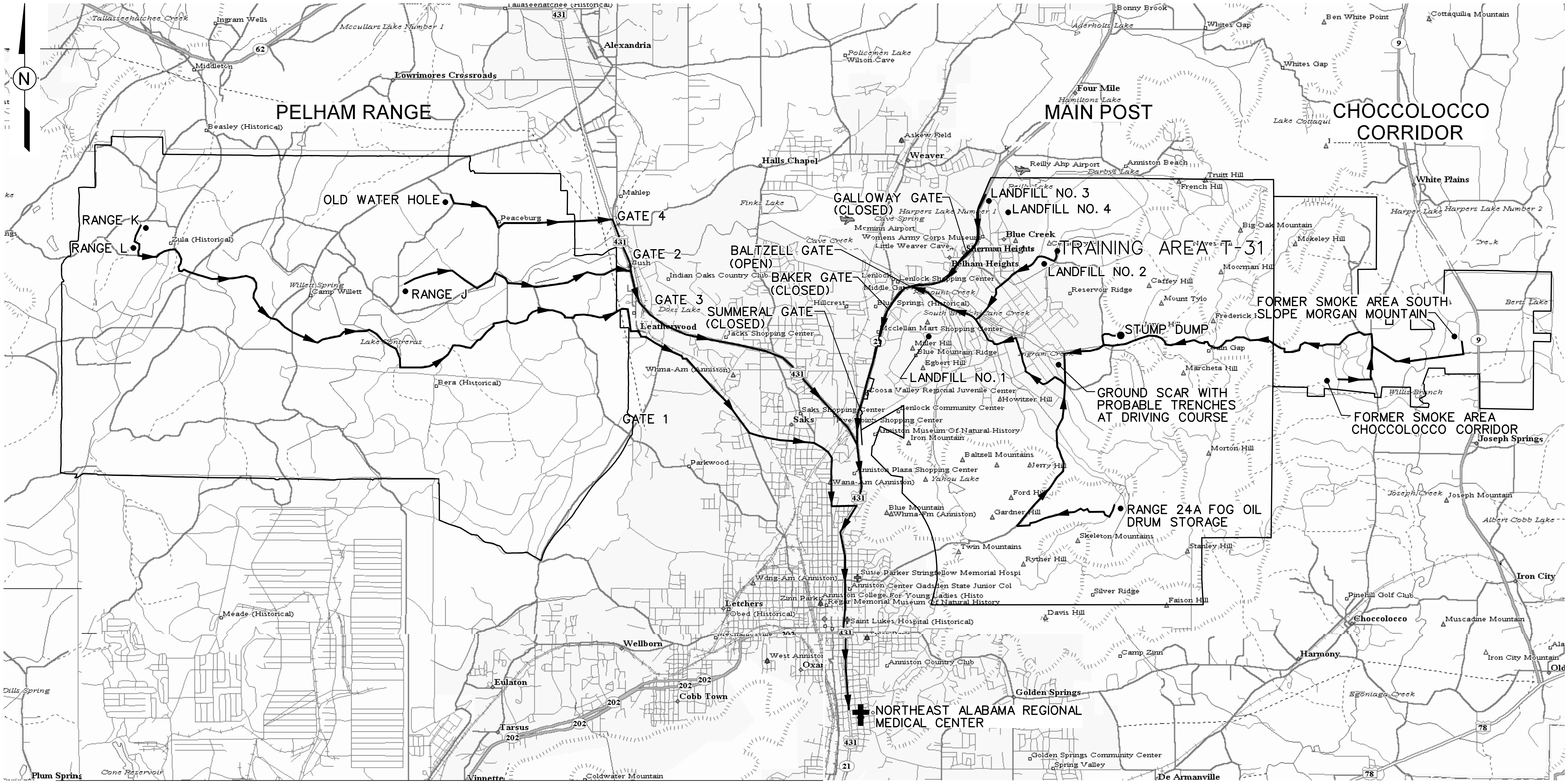
Activity Hazard Analysis
Site Investigation at Area M2, Subsection of Area 45
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Material storage	Flammable and combustible liquids	X Store in NO SMOKING AREA. X Fire extinguisher readily available. X Transfer only when properly grounded and bonded.
Disposal of investigation-derived waste (IDW) (Forklift Operation)	Personnel injury, property damage, and/or equipment damage	X Use qualified and trained forklift operators. X The operator shall not exceed the load capacity rating for the forklift. X The load capacity shall be clearly visible on the forklift. X Forklift operators shall inform their supervisor of any prescribed medication that they are taking that would impair their judgement.
	Cross-contamination and contact with potentially contaminated materials	X Stop immediately at any sign of obstruction. X Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination. X Only essential personnel will be in the work area. X Real-time air monitoring will take place before and during sampling activities. X All personnel will follow good hygiene practices. X Proper decontamination procedures will be followed. X All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations.
	Cut hazards	X Use care when handling glassware. X Wear adequate hand protection.
High-pressure water jetting operations	Heavy lifting	X Use proper lifting techniques. X Lifts greater than 60 pounds require assistance or mechanical equipment; size-up the lift.
	Slip, trip, and fall hazards	X Good housekeeping shall be implemented. X The work area shall be kept clean as feasible. Inspect the work area for slip, trip, and fall hazards.
	Fueling	X Only approved safety cans shall be used to store fuel. X Do not refuel equipment while it is operating. X Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition.

Table 5-1

Activity Hazard Analysis
Site Investigation at Area M2, Subsection of Area 45
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
High-pressure water jetting operations (continued)	Faulty or damaged equipment	X Equipment shall be inspected before being placed into service and at the beginning of each shift. X Preventive maintenance procedures recommended by the manufacturer shall be followed. X A lockout/tagout procedure shall be used for equipment found to be faulty or undergoing maintenance.
	High-pressure water	X Jetting gun operator must wear appropriate PPE including hard hat, impact-resistant safety glasses with side shields, water-resistant clothing, metatarsal guards for feet and legs, and hearing protection (if appropriate). X One standby person shall be available within the vicinity of the pump during jetting operation. X The work area shall be isolated and adequate barriers will be used to warn other site personnel.
	Unqualified operators	X Only qualified and trained personnel are permitted to operate machinery and mechanized equipment associated with water jet cutting and cleaning.
	Out of control equipment	X No machinery or equipment is permitted to run unattended. X Machinery or equipment will not be operated in a manner that will endanger persons or property nor will the safe operating speeds or loads be exceeded.
	Noise	X Sound levels above 85 dBA mandates hearing protection by nearby site personnel.
	Activation during repairs	X All machinery or equipment will be shut down and positive means taken to prevent its operation while repairs or manual lubrications are being done.
	Pinch points	X Keep feet and hands clear of moving/suspended materials and equipment. X Stay alert and clear of materials suspended
	Falling objects	X Hard hats are required by site personnel. X Stay alert and clear of material suspended overhead.
	Flying debris	X Impact-resistant safety glasses with side shields are required.
	Contact with potentially contaminated materials	X All site personnel will wear the appropriate PPE.



LEGEND:

- ROUTE TO NORTHEAST ALABAMA REGIONAL MEDICAL CENTER
- 431 U.S. HIGHWAY
- ✝ HOSPITALS
- • INVESTIGATION SITES

SCALE
0 8000 16000 FEET

FIGURE 1-2
HOSPITAL EMERGENCY ROUTES

U. S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
FORT McCLELLAN
CALHOUN COUNTY, ALABAMA
Contract No. DACA21-96-D-0018

IT CORPORATION
A Member of The IT Group

DWG. NO.: ...\774645es.284 | PROJ. NO.: 774645 | INITIATOR: A. MAYILA | PROJ. MGR.: J. YACOUB | DRAFT. CHCK. BY: | ENGR. CHCK. BY: A. MAYILA | DATE LAST REV.: | DRAWN BY: | STARTING DATE: 8/26/98 | DRAWN BY: D. BILLINGSLEY | 11/30/00 11:08:50 | DBILLING c:\cadd\design\view\774645es.284